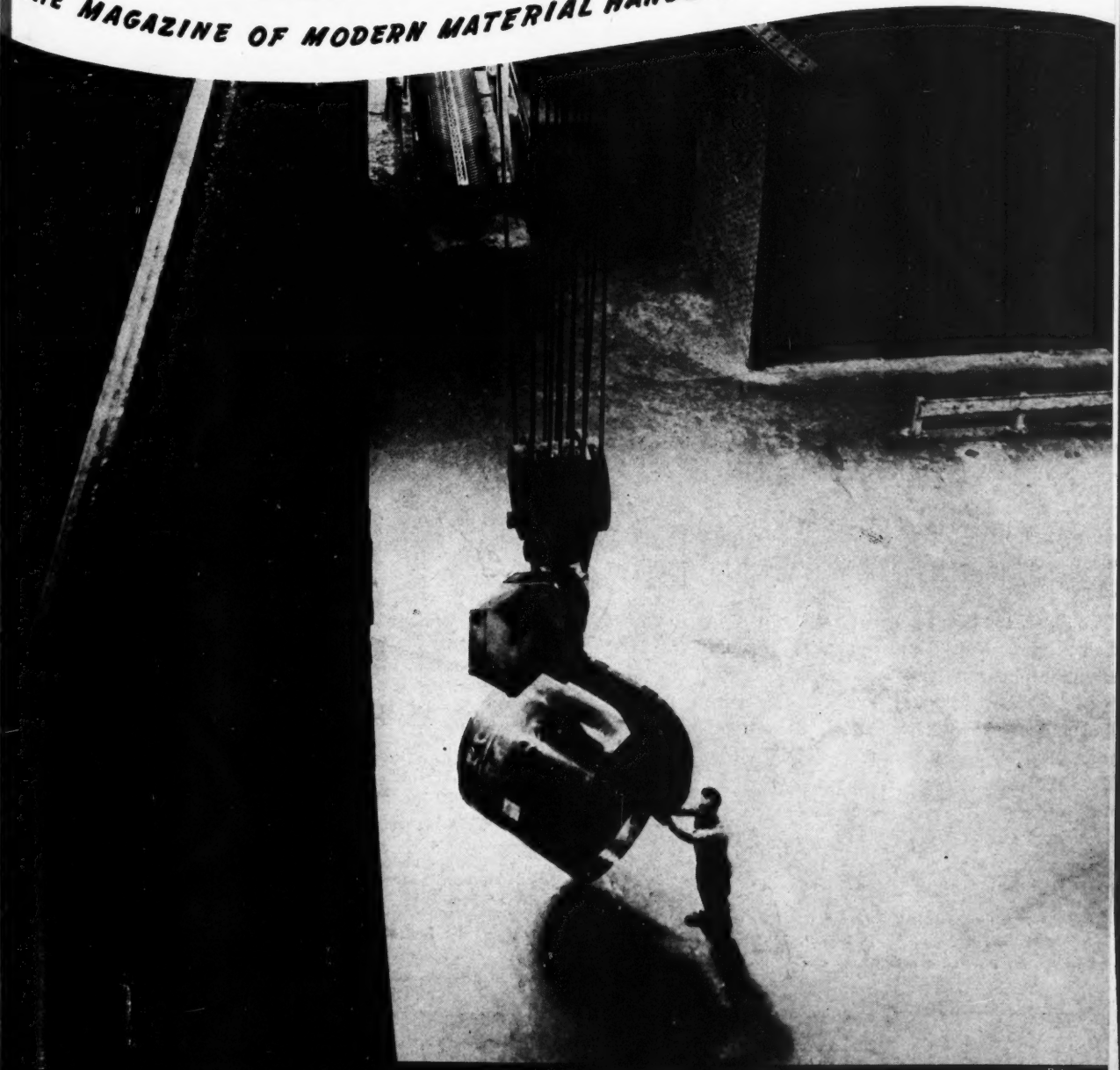
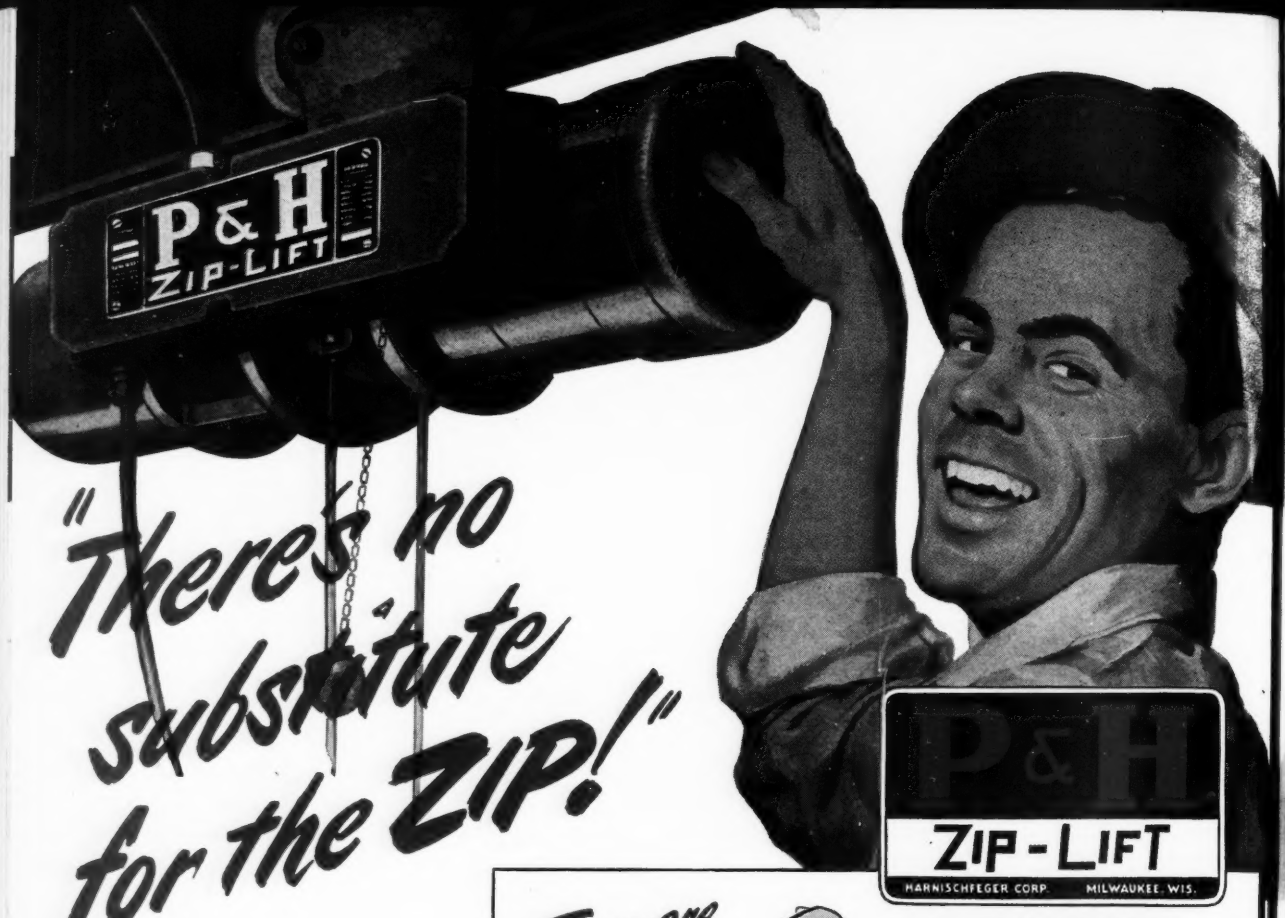
Flow

THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS



IN THIS ISSUE: { Hydraulic Tailgates with Rollers . . . Handling Sheet Steel
Packing Ceramic Insulators . . . Layout for Cinder Crushing



"There's no substitute for the ZIP!"

THAT'S why I like to install these Zip-Lifts! They don't have to be replaced every few years. They do everything *right*—and don't give us trouble. No wonder, experienced users say— *"there's no substitute for a Zip!"*

The Zip-Lift is the small wire rope hoist with full magnetic push-button control. It's the standout in quality — with *added* values you'd expect only in the most expensive hoisting equipment. Benefit by proved experience — tens of thousands of P&H Zip-Lifts are now in service. Why not add one to your handling now — to boost production and cut costs? They're available for prompt delivery.

Get the facts on the P&H Zip-Lift today. Ask for Bulletin H20-4 — complete with applications, pictures, specifications, etc.

These are added values!

SAFER — Full magnetic control with control current reduced to 110 volts at the push-button. Plugging crane type limit switch and large double brakes provide maximum safety. No open wiring.

LIFETIME CONSTRUCTION — Precision built — shaved gears running in oil — grease-sealed anti-friction bearings—fully enclosed, moisture-proof, dust-proof, acid-proof.

SMOOTHER OPERATION — Motor specifically built for hoist service — high starting torque, frequent reversal, etc. Loads controlled within a fraction of an inch.

ALERT SERVICE — Out-of-stock delivery from qualified dealers everywhere—backed by 18 branch offices and 8 conveniently located warehouses.

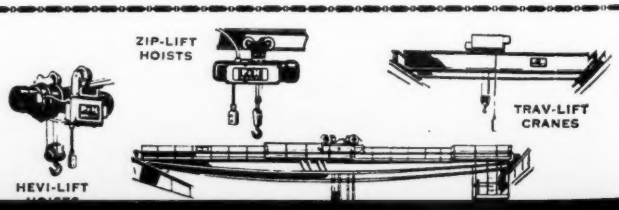
The Zip-Lift is America's fastest selling wire rope hoist.

Handle it thru-the-air at lower cost

AVAILABLE IN CAPACITIES UP TO 2000 LBS.

P&H ELECTRIC HOISTS
4643 W. National Ave.
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION
HOISTS • WELDING ELECTRODES • MOTORS • P&H • EXCAVATORS • ELECTRIC CRANES • ARC WELDERS



NOW

Amazing New Kind of SIT DOWN RIDING TYPE STACKER

RUNS ALL DAY FOR 22¢*

Saves You *HALF* In Moving and Stacking any Product

LOW ORIGINAL INVESTMENT

NO COSTLY REPLACEMENT EXPENSE

Everyone knows the famous Automatic TRANSTACKER . . . the high lift stacker that moves, lifts and stacks material with "touch of your thumb" ease.

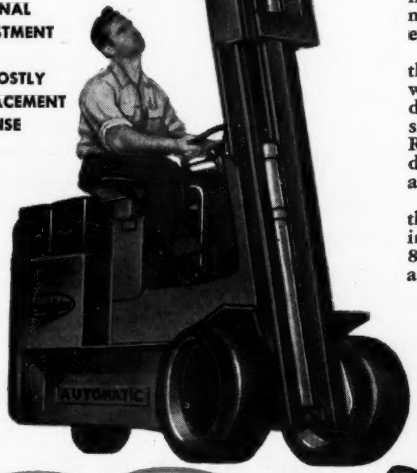
Now, for the first time, you get all the benefits of this miracle truck, but with the added advantage that you drive it like an automobile. Operator sits comfortably on the TRANSRIDER . . . does your material handling with utter ease, lifting, tilting and driving simultaneously.

With a telescopic lift mechanism, the Transrider raises load to 130 inches, with an overall height of only 83 inches for clearance through standard boxcar and factory doors. Single lift, before telescopic uprights are extended, is 66 inches.

The shortest of any truck of like capacity, Transrider is maneuverable in cramped working quarters. Carrying a 36-inch load, it can right-angle stack in nine-foot aisles. This means added storage space within present building capacities. Truck capacities range from 2000 pounds for 48-inch long load to 3000 pounds for a 28-inch load.

It does all this for as little as *22c a day battery charging cost . . . with maintenance cost, like the famed Transporter, exceedingly low!

At Transrider's new, low cost, every business now can use modern, money-saving material handling methods! Mail coupon for complete facts.



USERS SAVE THOUSANDS OF DOLLARS

MAIL COUPON FOR FREE CATALOG

New Tilting Type TRANSTACKER . . .

This is the famous Transtacker you walk with . . . and now made ever more efficient with new tilting uprights that cradle the load for easier, faster spotting of loads, and maximum protection for both operator and merchandise.

High pressure hydraulic single or telescopic lift stacks your product to new heights, to increase storage capacity. Finger-tip control lifts a 36-inch, 2500-pound load, or a 48-inch, 2000-pound load in a matter of seconds. Transtacker also operates on standard batteries, and chargers, interchangeable with the Automatic Transporter. Mail coupon.

Transrider Stacker

A PRODUCT OF AUTOMATIC

Lightens LIFE'S LOADS

AUTOMATIC TRANSPORTATION COMPANY

DIV. OF THE YALE & TOWNE MFG. CO.

141 West 87th Street, Dept. D-9, Chicago 20, Ill.

Please send me catalog and complete facts on the new, low-priced

☐ TRANSRIDER

☐ TILTING TYPE TRANSTACKER

Company Name.....

By.....*Position*.....

Street Address.....

City.....*Zone*.....*State*.....

MANUFACTURERS OF THE FAMOUS TRANSPORTERS, TRANSTACKERS AND SKYLIFT ELECTRIC TRUCKS

Flow

VOL. 4, NO. 7 APRIL, 1949

CONTENTS

COVER PHOTO—A 100-hp mill-type motor drives the main hoist of this 40-ton crane as it moves three tons of coiled steel about the plant. Safety codes for cranes and hoists are given on page 50 of this issue.

FEATURES

PACKAGING MECHANICS SECTION

DEPARTMENTS

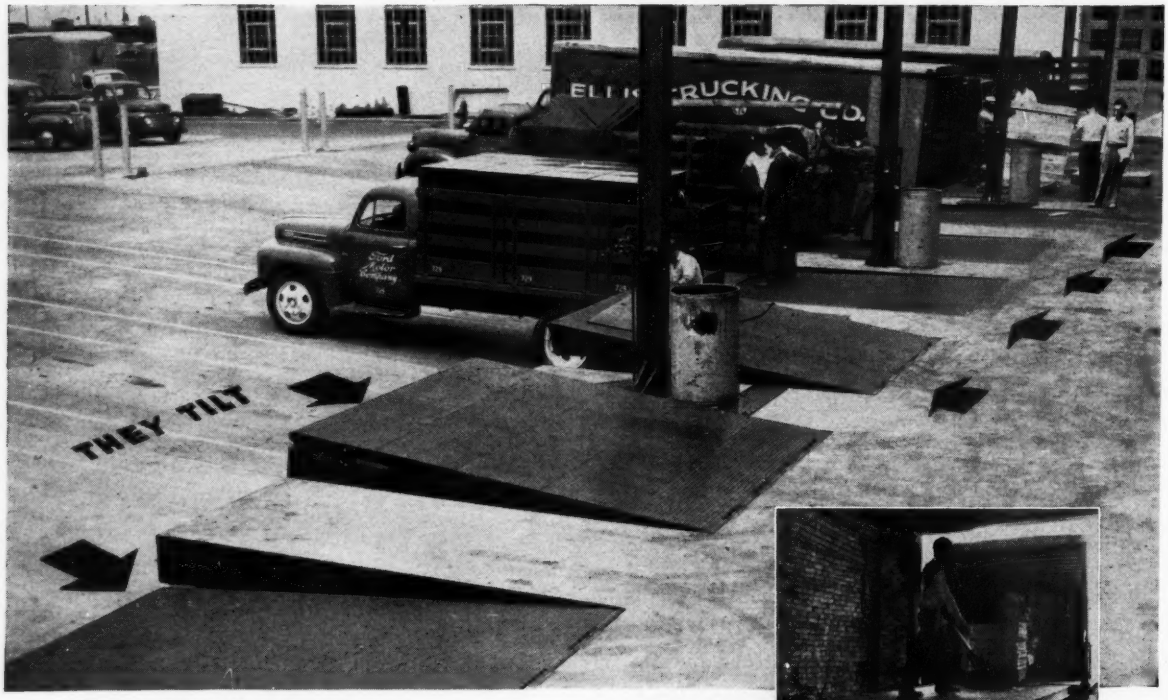
FLOW is indexed regularly by Engineering Index, Inc.

SUBSCRIPTION RATES

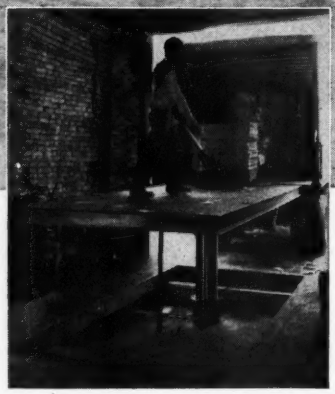
United States and possessions—$3.00 per year, $5.00 for 2 years, $6.50 for 3 years.
Canada—$4 per year, $6.00 for 2 years.
Foreign—$5.00 per year.
Single copy price—30 cents

"Acceptance under the act of June 5, 1934, at Milwaukee, Wisconsin, authorized August 15, 1947."

"LOADING TIME CUT IN HALF"



Tilting Loading Dock Ramps Tilt to Meet Truck Body. Operated by Hydraulic Lifts.



Standard Wayne Platform Lift Itself Becomes Loading Dock.

Cut Costs
WITH WAYNE LOADING DOCK LIFTS

YOU CAN save time and money with Wayne Hydraulic Leveling Ramps to adjust the level of the loading dock to the truck height. Material on skids can be directly transported into the truck body over a level path. A variance of as much as 20 inches in the height of truck bodies may be instantly adjusted by merely turning a valve. Users say: "Cuts loading time in half." . . "As good as doubling dock facilities."

SEND FOR ILLUSTRATED FOLDER

Use the coupon below to get all the facts on this new plan to cut costs at the loading dock. No obligation.

THE WAYNE PUMP COMPANY, FORT WAYNE 4, INDIANA
516 Tecumseh Street

Please send folder on time-saving Wayne Loading Dock Lifts and give us some idea of the cost.

NAME _____

ADDRESS _____

CITY _____ STATE _____

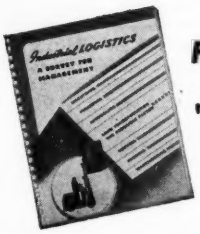
for your protection

NATIONWIDE SERVICE

INDUSTRIAL AIR COMPRESSORS • HOSE REELS • BULK PUMPS • POWER WASHERS

Taking full advantage of your

AIR-RIGHTS?



FREE BOOKLET
describes scientific materials handling—ask for "Industrial Logistics".

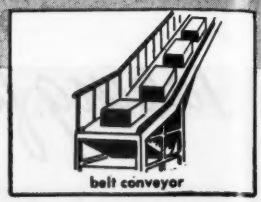
Are your loads scattered around over costly floor space, leaving a vacuum overhead? Using Elwell-Parker trucks you can handle your loads in master units, and high tier them to utilize profitably all overhead space. Elwell-Parkers do this work for less because of their "finger-tip" control, inching speeds when needed, safety features against overload, and unobstructed vision. E-P trucks also operate silently and without vibration.

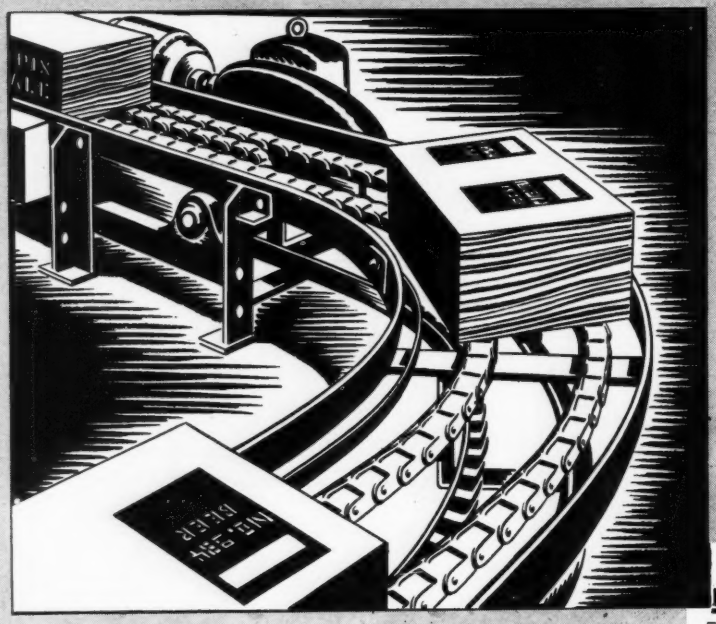
Your near-by EP man can bring your materials handling program up to date—remember he has the benefit of Elwell-Parker's unique materials handling experience gained by more than 40 years of service to over 300 industries. The Elwell-Parker Electric Co., 4539 St. Clair Ave., Cleveland 3, Ohio.

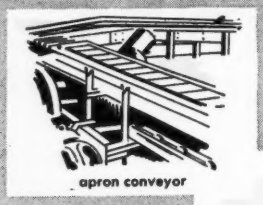
ELWELL-PARKER *Established 1893*

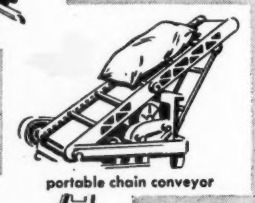
POWER INDUSTRIAL TRUCKS

CONVEYORS for aspirin or airframes

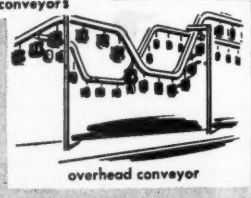

belt conveyor

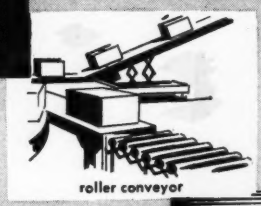

Chain conveyor with G-E electric drive

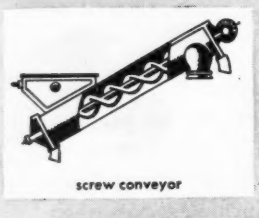

apron conveyor

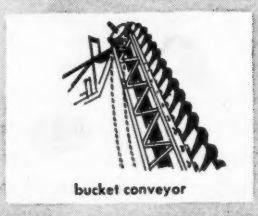

portable chain conveyor

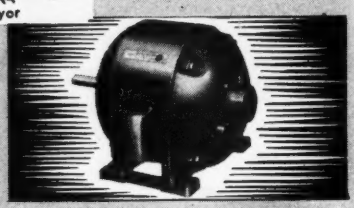

interlocking conveyors


overhead conveyor


roller conveyor


screw conveyor


bucket conveyor

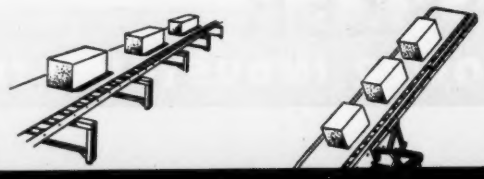

3 GOOD REASONS! Tri-Clad induction motors are protected against physical damage, electrical breakdown, operating wear and tear. Ratings from 1 to 2000 hp.

See General Electric's new MATERIALS HANDLING MOVIE

Ask your materials handling equipment supplier or G-E representative to show you "Materials Handling—In Receiving, Warehousing and Shipping"—General Electric's authoritative new movie covering in detail the latest techniques and equipment, without sales bias. When you see the movie, you will receive a copy of the 92-page technical manual which supplements the film. ASK TO SEE THIS PROGRAM NOW!

Everything electrical for MATERIALS HANDLING

CONVEYOR DRIVES



CRANE DRIVES

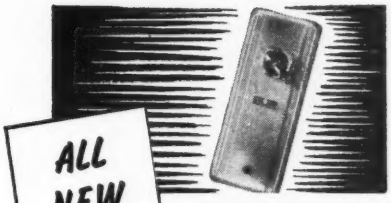
...POWERED by G.E.

Here's how General Electric's broad experience in engineering conveyor drives can help you cut your over-all handling costs

Among the many services we offer builders and users of materials-handling conveyor systems, two are outstanding.

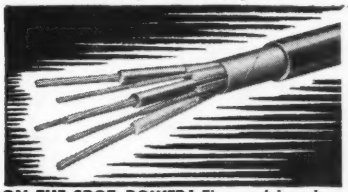
The first is *sound application engineering.* Our materials-handling specialists know conveyor-drive engineering inside and out, having electrified more different types of conveyor systems than any other similar group of engineers.

The second "plus" we offer is one of the largest and most varied arrays of electric motors, controls, and power distribution apparatus available today. Some of them are shown below. Components like these, correctly engineered into a drive will give you a system that is *right* for your needs, today and tomorrow. Consult with your local G-E office before specifying *any* conveyor drive equipment. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

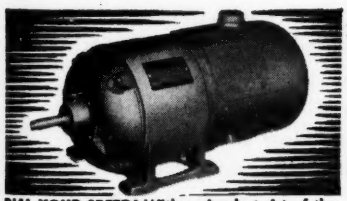


QUICK, SURE STARTS! The new G-E combination starter features a tough "strong-box" magnet coil.

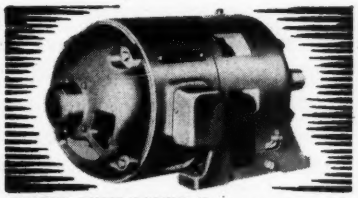
SAFE AND COMPACT! The new G-E a-c starter offers protection for men and machines in one compact unit. Easy to maintain.



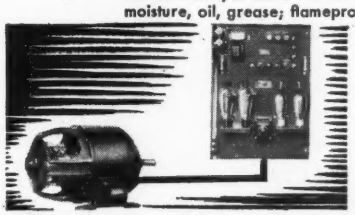
ON-THE-SPOT POWER! Flamenol bus-drop cable is used for 600-volt branch circuits from bus to conveyor motors. Resists damage from moisture, oil, grease; flameproof, too.



DIAL YOUR SPEED! With a simple twist of the dial, a G-E Type ACA motor gives you stepless speed adjustment over speed ranges of 3 to 1, 6 to 1, or 20 to 1. Ratings from 3 to 75 hp.



GEARED 'WAY DOWN! You can get a wide choice of speed reduction in a G-E gear motor . . . down to a few rpm. Ratings from fractional horsepower to 50 hp.

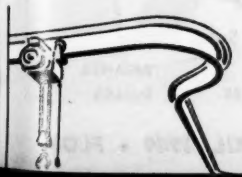


20 TO 1! G-E Thy-mo-trol drive provides speed ranges as high as 20 to 1 *from a-c power.* Speed adjustment is smooth and stepless. Ratings available from ⅛ to 25 hp.

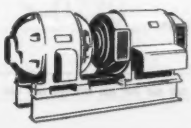
GENERAL ELECTRIC

668-70

HOIST DRIVES



INDUSTRIAL TRUCK DRIVES & BATTERY CHARGERS



LOWER your "Break Even" point with MOBILIFT!

With today's leveling-off process, profit margins may be smaller. To lower your "break-even" point may be your prime concern. Then every cost will have to be studied — every economy will have to be made.

In materials handling you will probably find your greatest wastes—and your greatest opportunities for savings. That is why so many plant executives have "Mobilized" their materials handling operations. Mobilift is designed not only for lower initial costs, but for lower per unit costs of handling materials. Its compact design, its adaptability to many types of handling and its speed of operation have lowered handling costs for thousands of American industries.

"Mobilize" now for a lower "break-even" point in your operation. Sign the coupon below and let us prove the economy of a Mobilift handling system in your plant.

MOBILIFT CORPORATION
835 S.E. Main St., Portland 14, Oregon

F-1 Please send me your illustrated folder on Mobilift operation.

Name_____

Firm_____

Address_____

City_____ State_____

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"The MIGHTY MIDGET"

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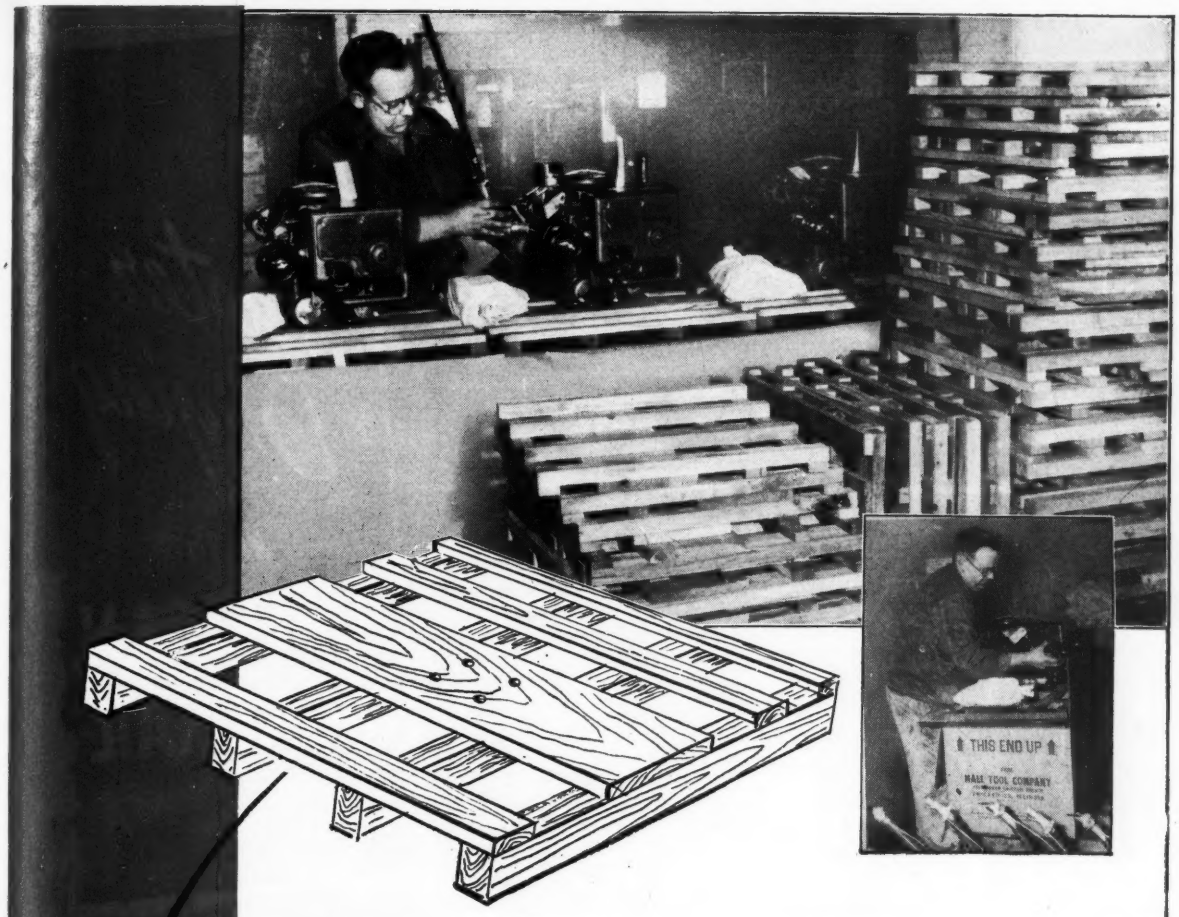


Custom Designed Motor Mount

CUTS SHIPPING COSTS

To effect greater efficiency and economy in the shipment of Mall Tool Company's Gas Engine in corrugated cartons, a special motor mount was needed. Our engineering staff, from specifications, drew plans for quick, labor-saving packing which assured safe and stationary shipment of the engine in transit. The use of this motor mount reduced shipping costs and increased efficiency of handling operations.

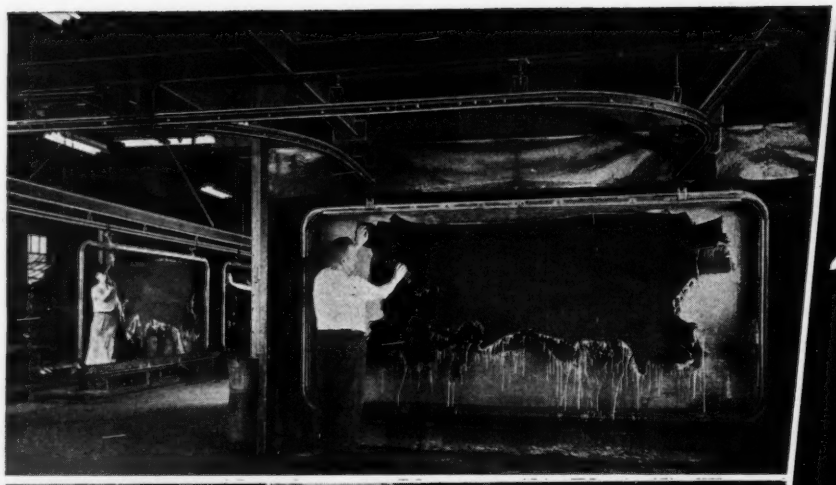
Completed drawings were sent from Sterling's Chicago headquarters to our Fabrication Plant at Goodwater, Alabama. It was there that experienced operations men, at the source of the lumber supply, effected economies in production which reflected important savings to the Mall Tool Company.

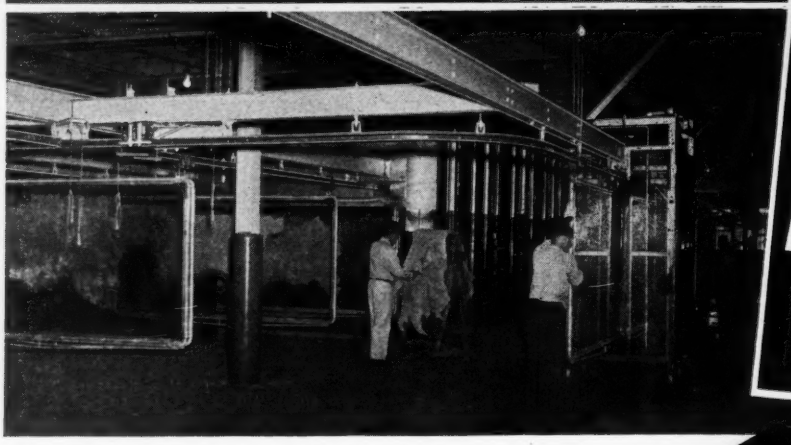
The Sterling combination of able engineering staffs and low operating costs at the source of lumber provides your organization with every type of lumber product efficiently and economically.

Call on Sterling for lumber products of every kind . . . designed to do the job . . . designed to meet your specifications. Write Dept. FM1 today for our interesting and helpful brochure, "A New Era in Lumber Service."

Sterling LUMBER & SUPPLY COMPANY

11900 So. Halsted Street
Chicago 28, Illinois
PU Ilman 5-0220





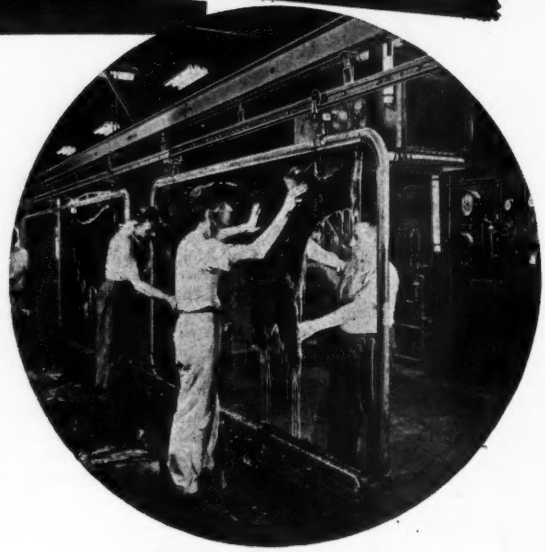
Faster Drying with AMERICAN MONORAIL

Here's a simple MonoRail loop with carriers and "kicker" switches that really speeds up leather drying.

Sides or skins are pasted on glass plates in carrier frames suspended from a MonoRail track; all unnecessary manual handling is eliminated. After the wet leather is pasted on glass, the carrier moves through the dryer without rehandling and the dried leather is stripped from the glass plate for further processing.

An automatic switch transfers the carrier from single to double line travel through the dryer. After the leather has been removed, the carrier is automatically transferred from double to single line travel through the plate washer and pasting stations.

This is just another example of the simplicity of MonoRail application that most economically correlates transfer and processing operations. An American MonoRail engineer can show you how you can increase production and lower costs with American MonoRail Overhead Handling.



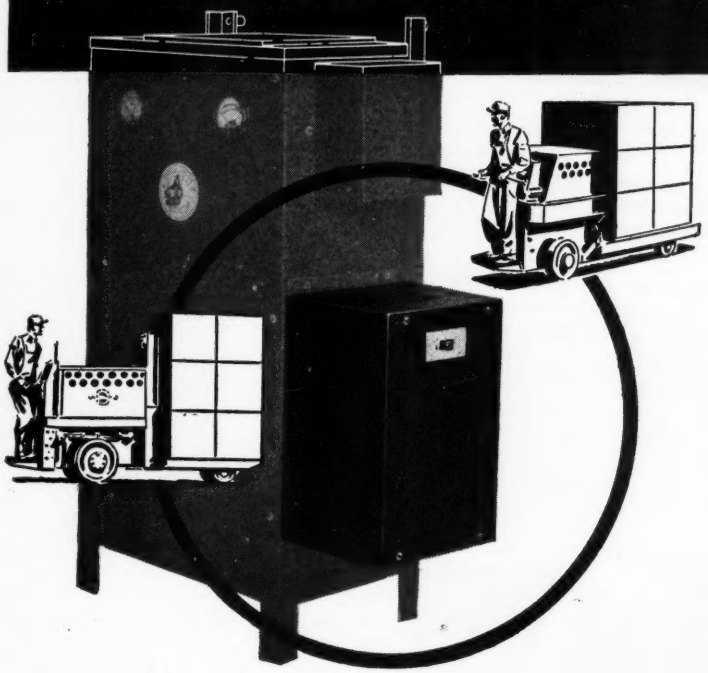
Photographs through courtesy of Proctor and Schwartz, Inc.

THE AMERICAN MONORAIL COMPANY

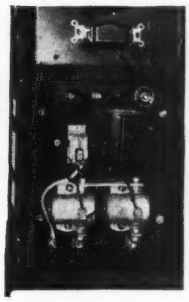
13129 ATHENS AVENUE CLEVELAND 7, OHIO

Now
double the use of your copper-oxide battery charger.

With the new G-E Sequence Charge Control, a single-battery charger handles 2 batteries



Imagine two batteries on one rectifier charger! That's just what you get with the new G-E Sequence Charge Control. Hook up two batteries instead of one at closing time—and by morning you have two fully charged batteries. No experts needed. No supervision necessary. Simply clip on the batteries, set the time control to the proper charge and forget it. The Sequence Charge Control does the rest—even to automatically cutting out the charger when a full charge is reached.



Here's how it works

Both batteries are connected to the charger. The time control is set and the charging starts automatically—in sequence. First one battery receives a high-rate charge until it's about 85 per cent charged. Then automatically the other battery receives its high-rate charge. Here the charging rate changes—again automatically. Both batteries receive, simultaneously, a safe, finishing rate charge until they are up to full capacity. At this point, the charger automatically cuts out. (Should you have only one battery to charge, flip a switch and it operates as a single-battery charger.)

A MONEY-SAVER FOR YOU With a G-E Sequence Charge Control installed on your present—or new—copper-oxide battery charger, you can handle twice as many batteries. Yet the cost is much less than that of an additional charger. You still retain every single feature of G-E copper-oxide battery chargers that has made them industry's favorite—automatic operation, two-rate charging, practically no maintenance, complete flexibility and 100% dependability. You'll want more information! Send in this coupon today—for the latest short-cut in material-handling costs.

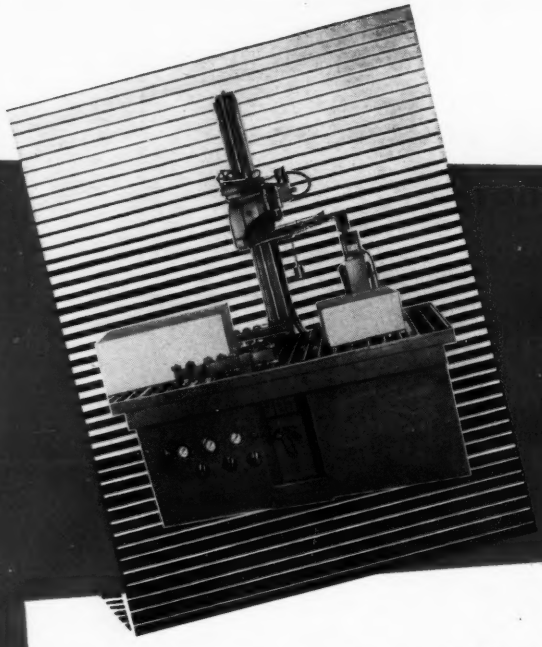
GENERAL ELECTRIC

Section B456-201
Apparatus Department
General Electric Company
Schenectady 5, N. Y.

I want more information on the G-E Sequence Charge Control:

☐ Please have a G-E representative call.
☐ Please send me, free, Bulletin GEA-5272

Name ..... Title .....
Company .....
Address .....
City ..... Zone .... State .....



You . . .

are paying for an International Retractable Anvil Staple machine right now. . . . Why not have one and get your money's worth?

● We believe, if given the opportunity, we can prove the above statement to your complete satisfaction. International Retractable Anvil Staple Machines are saving users up to 50% in their shipping rooms.

Our machines close *filled* fibre or corrugated cartons *from the outside, tops and bottoms simultaneously.* In many cases one machine with one operator can take care of an entire plant's output. We merely ask for the opportunity to show you . . . International Rectractable Anvil Staple Machines will do the rest!

Above is our Model C2-E . . . pneumatically operated . . . can be worked into any conveyor assembly, or be efficiently operated "on its own." Below is the finished product . . . neat and strong . . . meets the full requirements of the Consolidated Freight Classification.

INTERNATIONAL STAPLE & MACHINE CO. HAVERTOWN PENNA. U.S.A. Retractable Anvil

EST. 1938

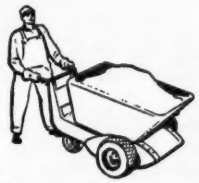
AMA SHOW
ATLANTIC CITY
MAY 10-13 BOOTH 323

INTERNATIONAL STAPLE & MACHINE CO.
HAVERTOWN 16, PENNA.
DISTRIBUTORS IN PRINCIPAL CITIES

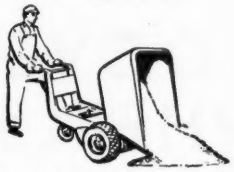
From bricks to gears, fertilizer to flowers

The BELL Prime Mover

speeds production, saves manpower, cuts costs

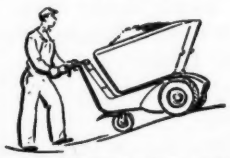


Bucket holds 10 cubic feet . . . 18 with sideboards

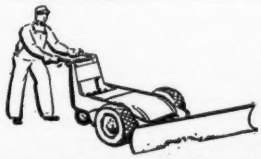


Mechanically dumped . . . operates by foot pedal

9-square-foot steel platform takes half-ton loads



Climbs 20% grades fully loaded



50-inch steel blade makes Prime Mover an efficient snow plow

FEATURES:

- gear driven . . . no belts or chains
- fully enclosed engine protected against dirt and moisture
- clutch, engine, transmission all run in oil
- switch from bucket to platform without tools . . . in less than a minute
- turns in its own length (63½"); width 31½"
- 3-gallon tankful of fuel gives 8 hours continuous service

A PRODUCT OF

BELL Aircraft CORPORATION

Here are a few reports from industries now profitably utilizing the clear-cut advantages of the Bell Prime Mover . . . a machine combining the features of a giant motorized "wheelbarrow," a 9- or 14-square-foot platform truck of unusual mobility, and a sturdy, low-cost snow plow.

Georgia Vitrified Brick & Clay Co.: Reports savings of 40 man-hours a week, carting material from borrow bed.

Lima-Hamilton Corp.: "In hauling shavings and turnings, the Prime Mover is making 4-5 trips more per hour than one man with an ordinary wheelbarrow," writes John S. Dixon, assistant to the vice president.

Knoxville Fertilizer Company: Here a Prime Mover saves 8 man-hours daily transporting bagged fertilizer from mill to box cars and trucks.

Reading Greenhouses, Inc.: General Manager Harold Christensen writes about two Prime Movers used for changing soil in greenhouses: "They have practically revolutionized this laborious job. We have done away with our usual 8-man wheelbarrow brigade and now do the job with only two operators in just a portion of the time . . . we wonder how we got along before without them."

This quick round-up of Prime Mover success stories can have important implications in your business . . . for there are certain to be one or more operations in your own plant that can be done with Prime Movers . . . faster, with less manpower, at lower cost. Such jobs could include coal passing, ash removal, snow plowing, movement of bulk raw materials.

An on-the-job demonstration will quickly support this thinking. If you would like to see a Prime Mover or a fleet of them in action, a member of our nationwide sales and service organization will gladly arrange a demonstration. For more information, please sign this coupon, clip it to your letterhead, and mail it to us.

SEND COUPON NOW

Bell Aircraft Corporation
P. O. Box 1L4, Buffalo 5, N. Y.

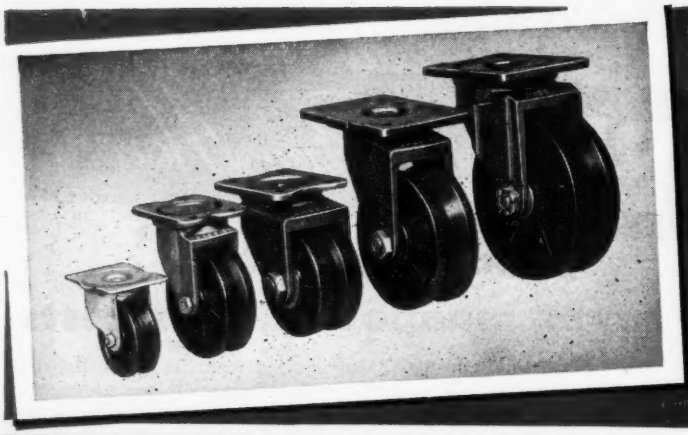
Please send facts on the Bell Prime Mover.
Who is the nearest distributor?

Name .....

Company .....

Address .....

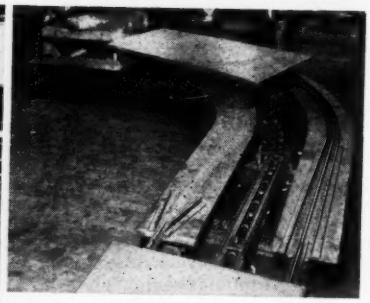
City, Zone & State .....

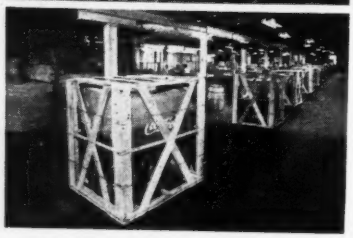


Bassick Casters WITH GROOVED WHEELS

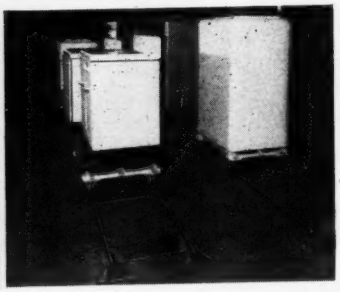
Speed Up Materials Handling On Inexpensive Angle Iron Floor Track

Throughout Industry, Leading Manufacturers Are Now Moving Materials Easier . . . Faster . . . At Much Less Cost . . . With This Simple, Flexible, Economical System.





The familiar red Coca-Cola dispensers made by the Cavalier Corporation, Chattanooga, Tenn., move swiftly and easily from assembly line to shipping room. Upper left: Finished units roll onto cable-drawn dollies equipped with Bassick Grooved-Wheel Casters running on angle iron tracks. Left center: Crated units move steadily along, without manual handling. Upper right: Showing how simply dolly is guided around curves — outside wheel on V-tracks, inside wheel on flat surface.



For smoother handling of its gas ranges and electric furnaces, The Montag Company of Portland, Ore., standardizes on Bassick Grooved-Wheel Casters and the simplest type of angle iron track. Photo at right shows V-shaped openings that guide wheels from floor to track.

In Bassick Grooved-Wheel Casters on angle iron track you have a materials handling system that is low in first cost, low in upkeep, and easily relocated to meet changing needs. This modern, money-saving method may greatly benefit *your* materials-handling operations. For further facts, write to THE BASSICK COMPANY, Bridgeport 2, Connecticut. DIVISION OF STEWART-WARNER CORP. *In Canada:* BASSICK DIVISION, Stewart-Warner-Alemite Corporation, Ltd., Belleville, Ontario.

Sold By Leading Industrial Distributors

A few of the many industries using Bassick Grooved-Wheel Casters: ***Aircraft . . . Automotive . . . Boat Storage . . . Ceramics . . . Chemicals . . . Food Processing . . . Foundries . . . Furniture . . . Lumber Yards . . . Metal Working . . . Prefabricated Housing . . . Small Boat Building, Etc.***

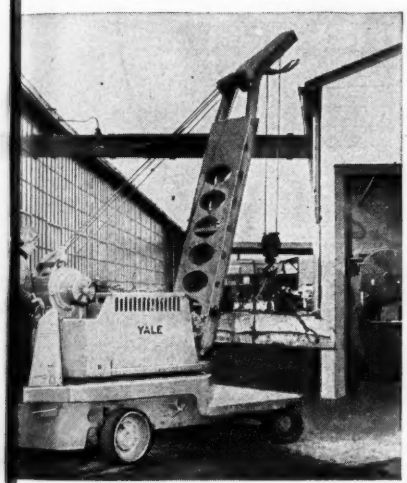
Making more kinds of Casters... Making Casters do more

Bassick

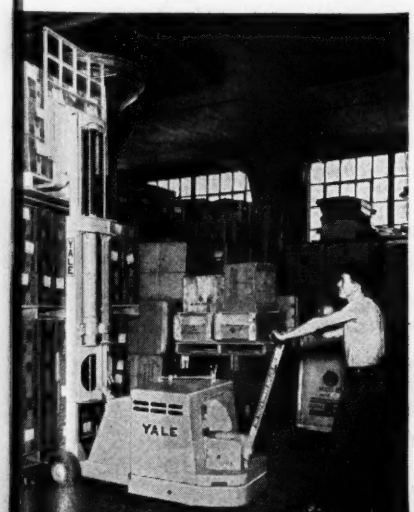
Break bottlenecks in production and your

COSTS TUMBLE

goes a pallet load. High stacking of multi-unit ds puts storage space to fullest use. Yale High Lift rk Trucks handle loads up to 30,000 lbs. in a single eration. High Lift Platform Trucks have capacities to 50,000 lbs. Low Lift models, to 60,000 lbs.



le Crane Trucks are used to lift and stack all kinds of ds in plant and yard. They also transport material, eed assembly of machinery and handle many maintnance jobs. They slew and boom easily, travel fast. pacities up to 10,000 lbs.



This Worksaver Electric Truck has a telescopic lift of 10 feet and can handle loads up to 3,000 lbs. The operator steers the truck as he walks. Lift and tilt are hydraulic. Nine other Worksaver models include high and low lift platforms, pallet and tin plate, and a tractor.

Production gets in a jam when material isn't kept "on the move." If you are up against this problem in your plant, it will be well worth your while to learn how modern material handling machinery can open the way to greater output.

Right now you may not know exactly what kind of handling equipment will do the best job and save money at the same time. So your best bet is to get the benefit of the experience of Yale & Towne, pioneer in the manufacture and correct application of material handling machinery.

The Yale line of material handling machinery is so complete and diversified that selection for specific requirements is easy. Whether you need hand or electric hoists, hand lift or power trucks or scales, Yale representatives throughout the nation and the world will gladly help you find ways to break production bottlenecks, save time and effort and cut handling costs.

Take care of the present and plan for the future with Yale Material Handling Machinery. Get in touch with our nearby representative or write direct to headquarters.

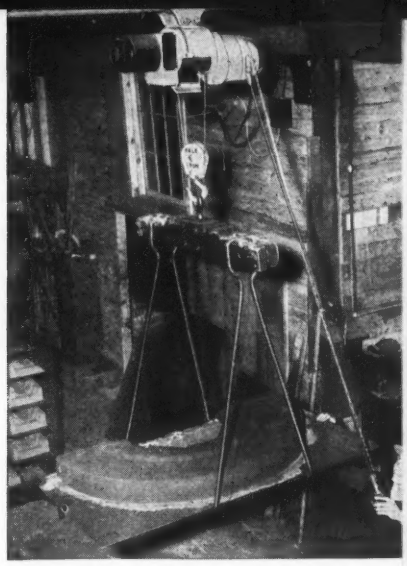
TOOLS THAT KEEP INDUSTRY "ON THE MOVE" **YALE**

THE YALE & TOWNE MANUFACTURING CO.

Department L-6

Roosevelt Boulevard **Philadelphia 15, Pa.**

Yale Load King Scales provide the unparalleled accuracy of the exclusive MAGNETROL mechanism. They speed weighing, batching, counting, measuring and testing. There's a model for every industrial need—every type from bench to crane scales. Capacities to 60,000 lbs.



Fragile loads are handled safely and efficiently by t fast Load King Wire Rope Electric Hoist. Yale mak time and effort saving electric hoists in capacities up 12 tons. Hand chain hoists are built to lift as much 40 tons.

"Easy lift, easy roll, easy steer" summarizes the qu ities of Yale Hand Lift Trucks. Because they can han so much in a single trip, they help break producti bottlenecks. Capacities range up to 20,000 lbs. Platfor pallet and tin plate models.

YALE

MATERIAL HANDLING MACHINERY • hoists — hand and electric • trucks — hand lift and power • industrial dial scales

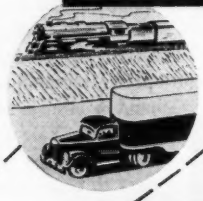
Truscon has the

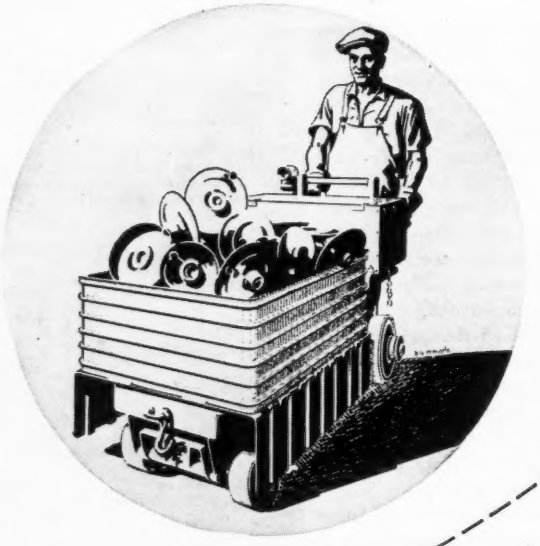
technical service

design

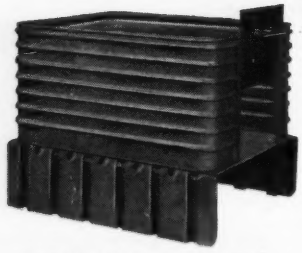
steel materials

deliveries

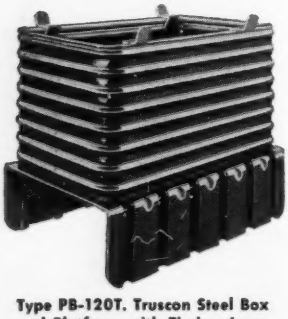




you need in steel boxes



Type PB-650. Truscon Box and Platform with sliding End Door.



Type PB-120T. Truscon Steel Box and Platform with Tiering Lugs.

. . . and they all add up to *better production* for you!

Better production because Truscon Steel Boxes are efficient . . . are made to fit specific materials handling jobs.

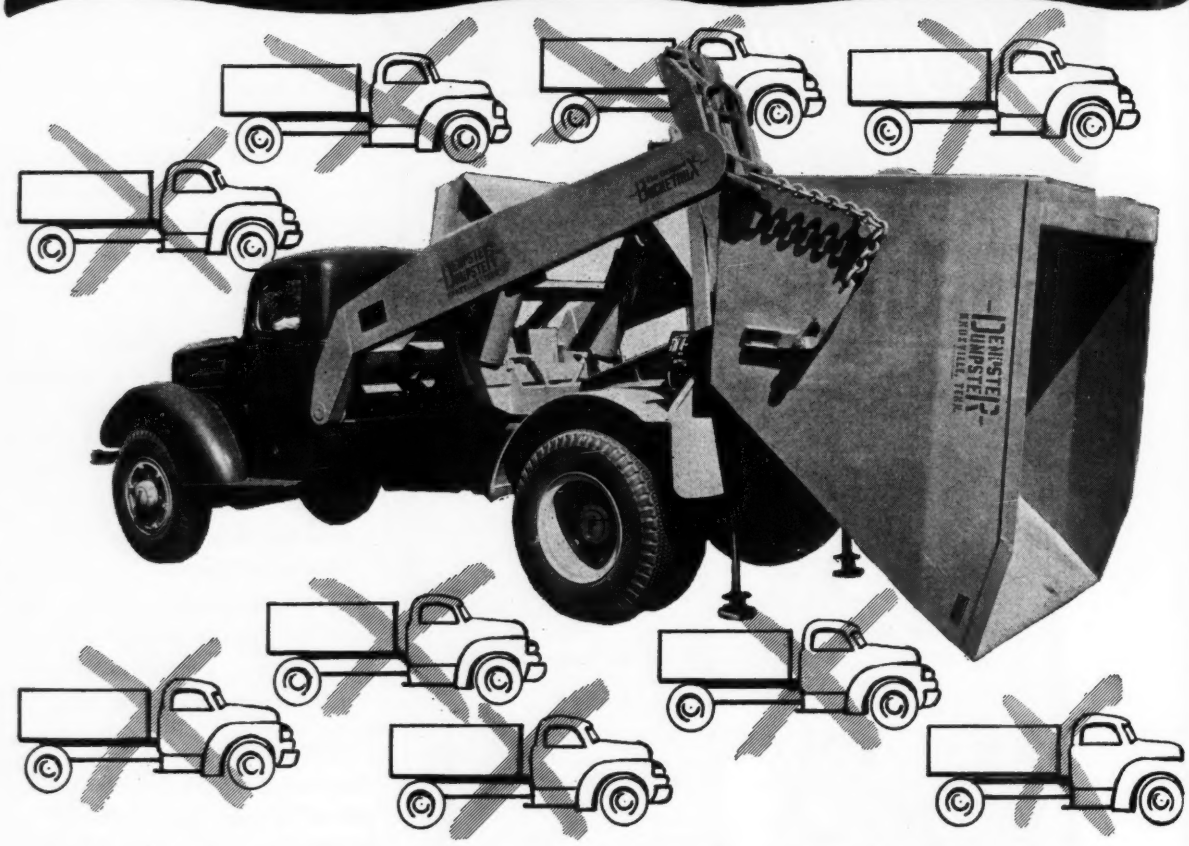
Better production because Truscon Steel Boxes assure *continuous* production! They're made strong where strength is needed... made of rugged heavy gauge steel that wears as only steel can wear... month after month, year in, year out!

Truscon's prompt delivery service helps factory production, too, because Truscon gets the boxes you need *where* you want them *when* you want them. Truscon men will be glad to work with you and for you to help select the right boxes for *your* particular jobs.

Send for Truscon's catalog complete with specifications and details on Truscon Steel Boxes and Platforms.

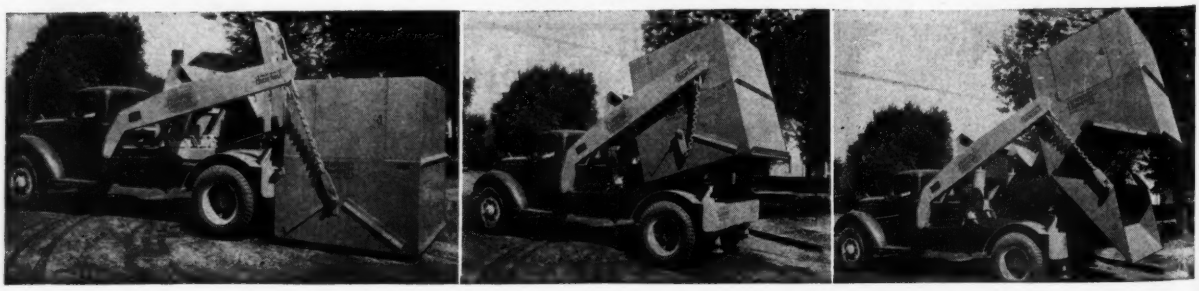
TRUSCON STEEL COMPANY
PRESSED STEEL DIVISION
6100 TRUSCON AVENUE • CLEVELAND 4, OHIO
SUBSIDIARY OF REPUBLIC STEEL CORPORATION

One Dempster-Dumpster with 99



Being a large operation, this copper smelter required ten trucks and their crews, a series of push cars, a train car system and loading crews to handle over twenty different kinds of materials on relatively short hauls between plant buildings and outside of the grounds. The materials handled included, scrap of all descriptions, trash, rubbish, new and used brick, excavation spoil, waste oils, filter cake, dust, sand, gravel, cement, fire clay and many others.

A large majority of the handling, re-handling, storage, truck and car equipment and crews standing idle, was eliminated by the Dempster-Dumpster System. Simply stated, this system provides quick pick-up of pre-loaded containers for hauling, dumping or moving material to another location. The three pictures below show how it operates. The left illustration shows the Dempster-Dumpster truck hoisting unit approaching a loaded container. Two chains are attached and the driver returns to controls in the cab. In the center photo, loaded container is hydraulically raised into carrying position. Controls in the cab permit dumping as illustrated at right. You too, may be able to adapt the Dempster-Dumpster System of Materials Handling to your business at tremendous savings. Let one of our engineers discuss this possibility with you.

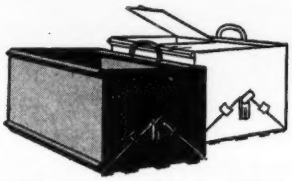


Containers replaces 9 trucks....

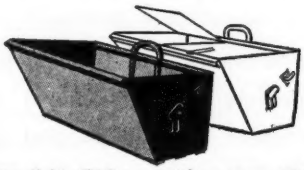
Over $50,000 saved annually . . . in this Copper Plant through faster, more efficient, materials handling

Here, in plain language, is what happened to Materials Handling costs after the Dempster-Dumpster System of Materials Handling was installed in a large Western copper smelting plant. A comprehensive Dempster-Dumpster survey had previously revealed costly delays, unnecessary handling and rehandling of materials, and much time wasted by loading crews. All have been eliminated to the tune of $50,000 savings annually. Fast pick-up, hauling and dumping of pre-loaded Dempster-Dumpster containers has replaced the old method of plant hauling. As a result, nine of the ten trucks formerly detailed for this work were eliminated or put on other work. Ninety-nine detachable containers, built in over 20 sizes and designs for the specific materials they were to handle, were spotted at material accumulation points throughout the plant. Some containers, provided with roller bearing casters, are rolled to indoor accumulation points. Some are handled by fork trucks, other by overhead cranes within plant buildings. As containers are filled, the Dempster-Dumpster truck hoisting unit and one man, the driver, picks each container up, hauls it to its destination, dumps it and returns the empty container for refilling or, loaded container is lowered at any point and left if desired. When you consider that pick-up and dumping of these detachable containers takes less than 60 seconds, and that the entire operation works to an on-the-run schedule, you will realize how one truck hoisting unit can handle 99 containers and do the work formerly requiring ten conventional trucks.

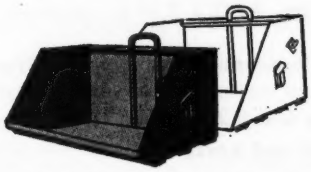
In the panel below are shown the basic types of Dempster-Dumpster Containers used in this installation. The basic containers can be altered with lids, casters, hose and chute connections, etc., to handle accumulations of any type material whether it be liquid, solid, dust, gas, light or heavy materials.



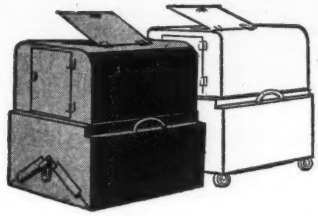
Forty-nine open top, drop-bottom containers in 3, 4, 8 and 10 cu. yd. capacities were spotted at 38 locations throughout the smelter operation. Four of these were 10 cu. yd. containers fitted with two end doors and a circular top opening for chute loading. Three of the 34—4 cu. yd. drop-bottom containers in this group were equipped with self balancing spring lids for special use.



Ten water tight, Tilt-Type containers were required to handle liquids or moist materials. Four of these were open top of 1½, 3 and 4 cu. yd. capacities for four locations. One 4 cu. yd. container with self balancing spring lids was provided at Lab Sample Mill. Three containers, with self balancing lids provided with pipe inlets, were supplied for receiving waste oil at three separate locations. Two 3 cu. yd. containers having three separate compartments with individual lids for each compartment, were required for the zinc electrolytic plant.



Two 4 cu. yd. skip-type, with lip, containers and two 4 cu. yd. skip-type, flat-bottom, containers were spotted at two locations. One 6 cu. yd. flat-bottom, skip-type container was furnished.



Thirty-three Universal-type containers in 6 and 10 cu. yd. capacities were spotted at 33 locations to receive trash, rubbish and other bulky materials. Two of these were mounted on roller bearing casters for movement to indoor loading locations.

Two 10 cu. yd. Apartment-type containers were spotted at the main office and laboratory office to receive large accumulations of waste paper and trash.

DEMPSTER DUMPSTER
TRADE MARK REG.
SYSTEM

DEMPSTER BROTHERS, Inc. 839 N. KNOX, KNOXVILLE 17, TENNESSEE

HOME OF Five-Fold *Slyver-Clad* BATTERIES

C & D's streamlined plant and laboratories (expanded 120%) are operated by an executive and supervisory force with an average of 26 years' service with the C & D organization.

AIRCOOL
18-CDS-19
540 A.H.

Slyver . . .

. . . is a revolutionary C & D development. Thick layers of infinitely fine glass fibres (.00025 inch average diameter) are laid parallel in a vertical position against the power-producing material in C & D's 30% heavier positive grid plate.

- **Increases work-life 35% . . . at NO EXTRA COST!**
- **Assures 20% EXTRA K.W.H. capacity!**
- **Efficient, dependable, low-cost performance!**
- **Backed by C & D ZONE SERVICE for both charging equipment and batteries!**

C & D BATTERIES, INC.

TELEPHONE · DIESEL · ELECTRIC INDUSTRIAL TRUCK · LOCOMOTIVE · STARTING & LIGHTING

Established 1906 **of Conshohocken, Pa.** SALES AND SERVICE IN PRINCIPAL CITIES

LET'S TAKE A TRIP

WANT to go some place? Well, go ahead. That's an American freedom we don't even list as one.

Pick your destination. Ten miles away or three thousand. Get going. When? Now. This evening . . . tomorrow . . . whenever it suits you. YOU.

No fat-headed official to interview and wheedle a passport out of while he looks down his nose at you. No birth certificate to produce to prove you were born. No work card with initialed spaces to show how you earned the dough you're going to spend. And no law to tell you the maximum number of bucks you can take with you.

The purpose of your trip? "None of your business, my fine-scaled fish! I am an American and I go and come as I like. Or I go and do NOT come, if it suits me better."

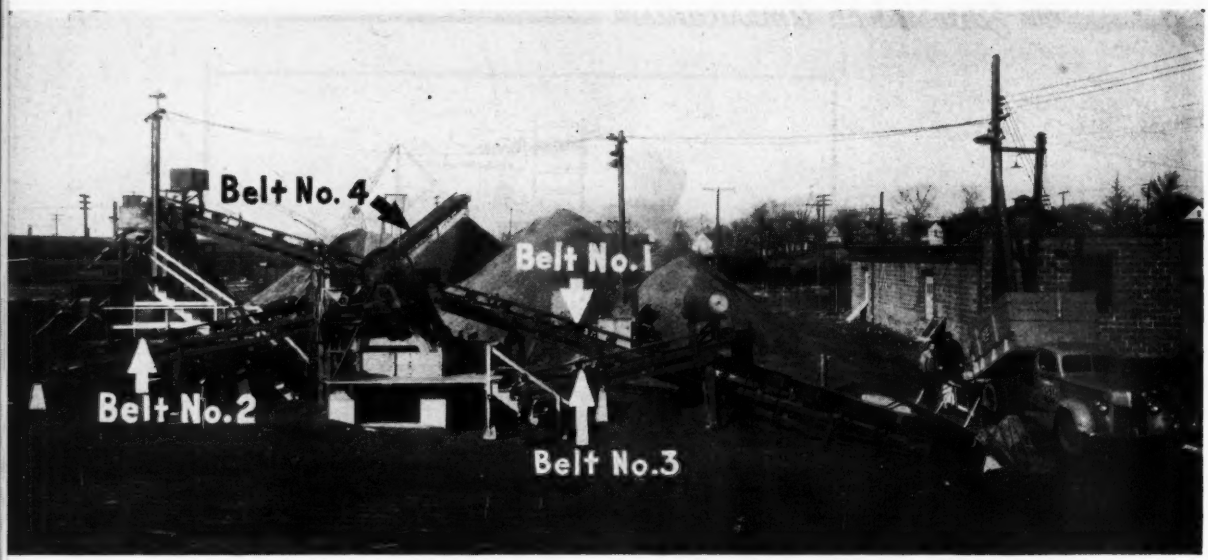
By what means are you going to travel? By train . . . bus . . . plane? The choice is as wide and free as the country itself. If by train, it's first class. We have no second and third. And when we say "first class", boy, we MEAN IT!

The privately owned railroads had better be good. They are competing for your favor. "Ride OUR line, Sir. And what can we do to make you happy?" That's the priceless stuff we were raised on. And if we get a cinder in our eye or a bedbug in the mattress, maybe we'll write to Congress about it.

Whoever heard of a big play being made out of our "Freedom of Travel"? Nobody, maybe. But we've got it just the same. It's an American right, along with a hundred others we just accept and never think about.

Well, *let's* think about them. Let's thank the men and women who pried themselves out of Europe way back then. Let's thank them for setting up this perfectly swell deal for us . . . planted a lot of freedom seeds which we today can harvest.

But let's do more than that, for heaven's sake! Let's APPRECIATE what we have. Let's keep our freedoms shining . . . not wait till we have to fight to get them back!



CLOSED SYSTEM of conveyor belts assures that no piece of cinder can leave until it has been screened.

A Layout for Cinder Crushing

By HAROLD E. GEIST
General Manager
The Geist Coal and Supply Co., Cleveland

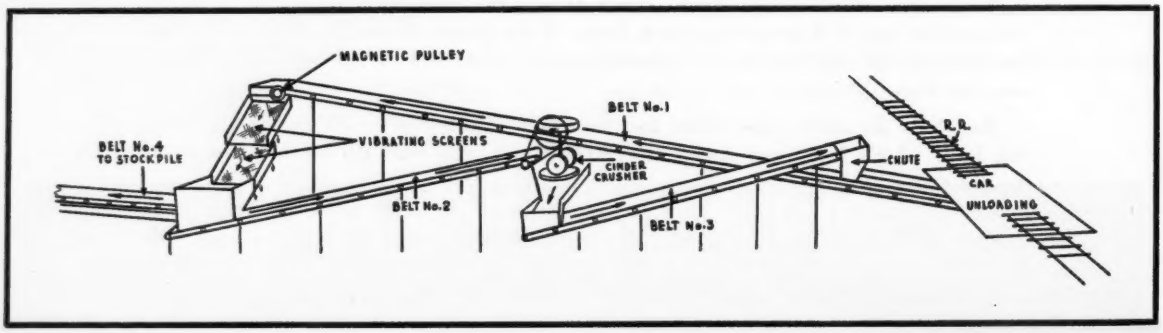
Standard belt conveyors and ingenious adaptation of machinery to a new field result in a high-capacity cinder crushing plant. Simplicity and productivity are key points of this layout.

CAR UNLOADER, FIXED AND PORTABLE BELT CONVEYORS

ABOUT three years ago the Geist Coal and Supply Co. installed a cinder crushing plant to provide this material as an aggregate in the manufacture of concrete blocks. *(This company's block handling operation by use of pneumatic forks was described in the January, 1948, issue of* FLOW.*—Ed.)* The feature of this operation that is continuing to attract nationwide attention is the application of a muller-type wheel crusher instead of the customary roll crusher.

Our president, Herbert Geist,

FLOW SHEET shows course of raw cinders to the stock pile. Cinders arrive by car and truck.



had traveled all over the country for many months to study cinder crushing methods. He was not satisfied with the most prevalent method used, roll crusher operation, because of high maintenance costs and down time factors.

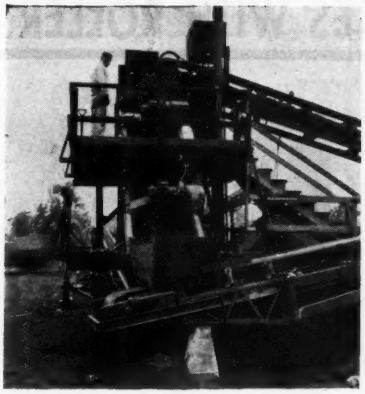
Herbert Geist had previously been owner and operator of a brick plant in which the dry pan method had been employed, (it involves the use of friction-operated muller wheels for crushing clay and shale). He decided to adapt such wheels to our cinder crushing plant.

The results have been extremely successful. During the three years the plant has been in operation, it has produced an average of 400 tons of crushed cinders per 10-hour work period. However this has not approached the capacity of the crushing machinery. We have run the 18-inch raw cinder feeder belt at maximum speed but have not as yet been able to overload the crusher. We are therefore planning to increase the conveyor capacity in order to balance it with the crushing capacity. Frankly, we do not know exactly what the latter is, but on the basis of past performance, we estimate the capacity to be approximately 70 tons an hour, or an increase of better than 50 per cent over the volume processed at present.

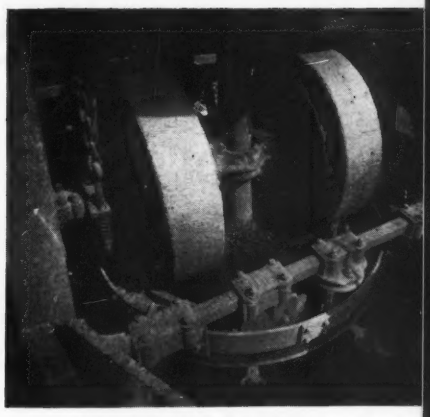
Initial Operations

The material flow can be followed conveniently on the layout sketch. The loading point is at the extreme right of Conveyor Belt 1, the feeder or supply line. Rail tracks at yard level pass this point, where an under-track, reciprocating-type car unloader is installed. Raw cinders can be unloaded into the receiving hopper either from hopper-bottom cars or dump trucks. The material travels on an 18" x 60' belt which rises from the pit to a height of 12 feet. The drive pulley at the head end is equipped with a magnetic separator which removes the ferrous material in the cinders. While the cinders are discharged over the head end, the iron particles are

(Turn to page 48)



CLOSE-UP OF VIBRATING SCREENS set in tandem. Note magnetic head pulley of conveyor No. 1.



GIANT SEVEN-TON muller-type wheels ar used for crushing. Crushing is done by friction

TWO 60-FOOT portable conveyors are used for sending screened out cinders to the stockpile.

24" BELT CONVEYOR takes cinders from pit to block making plant. All belts are troughed.

HYDRAULIC TAILGATES WITH ROLLER BEDS

PALLET HAND TRUCKS, FORK LIFT TRUCKS, PALLETS, HYDRAULIC TAIL GATES, ROLLER CONVEYORS

FORK TRUCK spots palletized load on elevator tailgate of outgoing truck. Note rollers.

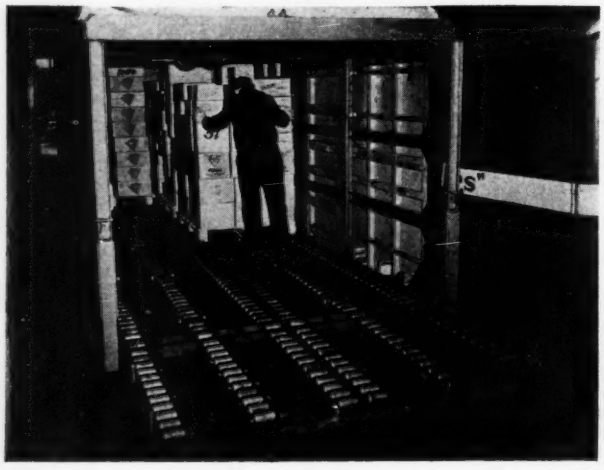
A system of roller conveyors in the delivery trucks of this grocery chain store company enables pallet loads of cased goods to roll over tailgates. This method extends pallet handling from the company's central warehouse to its retail food stores.

PART of the over-all pallet handling program at Cleveland's Fisher Bros. Co. is a novel method of employing roller conveyors in delivery trucks. Two partial three-lane roller conveyors extend the full length of the truck beds and over the hydraulically operated tailgates. Since there are no truck-level shipping docks at the retail outlets, the elevator-type lift gate overcomes this handicap, and their rollers make possible the removal of palletized cases with hand pallet trucks. This method was introduced within the past year, and it

(Turn to page 32)

HAND-LIFT truck is inserted between the conveyor lanes to transport goods to stock.

LOADED PALLETS are easily pushed to rear of truck. Stringers ride smoothly on rollers.



FLOOR LOAD CAPACITY RATING AND ITS RELATION TO INDUSTRIAL POWER TRUCKS

With the growing application of the load unit principle and of power trucks, the question of the load capacity of upper floors becomes increasingly important. This study suggests how to make a computation which will determine if an architect engineer should be consulted. As an example, it is recommended that a factor of 50 per cent be allowed as a safe figure for the increase of dynamic loading over static loading.

IN THE early applications of power trucks this equipment was usually confined to ground floors where there was ample floor capacity to carry almost any type of machine. But today it is often found that further savings can be made by extending the material handling system to upper floors of multistoried buildings. The question immediately arises whether or not the floor has sufficient capacity to support the truck with its load, in addition to the material or machinery that may be stored on these floors.

Building construction varies widely, and for this reason it is impossible to make a precise recommendation without a detailed technical study of the plant involved. For this reason it is always recommended that a competent architect-engineer study the plant in question in order to determine the weight of truck that would be permissible under the conditions obtaining.

Difference of Dynamic Load

In order to guide the engineer, a number of studies and tests have been made which should help the engineer in making his computations. This subject is important to industry, and, for this reason, truck manufacturers as a group have given much study to this problem, and have consulted many technical people in an attempt to arrive at a correct solution to the problem. As a starting point with a prospective application, it is always desirable to arrive at approximate figures yourself, to determine whether it is worth while to engage an engineer for a more detailed study. The following approach will serve this purpose.

The common types of industrial power trucks in use today impose a *dynamic* load to the floor of approximately 25% beyond the static weight of the loaded machine. This figure has been arrived at by numerous tests in actual plants, using both actual strain measurement on full-scale structures and special test setups.

Measuring apparatus was applied to the underside of the floor to indicate deflection of the structure. The truck was driven onto the floor and stopped in the center of a bay and the deflection noted. After this the truck was driven over the floor at full speed and the deflection noted. The truck was then run over an obstruction on the floor, causing a bump, with a corresponding increase in deflection. A further test was to drive the truck at full speed and come to a severe stop by applying the brakes, full power, in the middle of the bay, and the floor deflection noted. The load was raised and then lowered to the floor at full lowering speed, and the deflection of this impact noted. In all of these tests the maximum deflection noted was 25% in excess of the deflection caused by a loaded truck standing still. From the data thus compiled it is our judgment that a factor of 50% be allowed as a safe figure for the increase of dynamic loading over static loading.

Concentrated Load Factor

An industrial truck does not exert its full weight at a fixed point, but instead distributes that weight at each of its four or six wheels, as the case may be. However, the wheelbase and the wheeltread of trucks which operate in multistoried buildings are relatively small, and for this reason we consider the truck as applying its load at a single point—that is, exerting a concentrated load on the floor. Since the load is concentrated it will produce a bending moment approximately double that which would be produced by a uniform load on the beam structure of the floor. By this approach it is found that on a normal 20′ x 20′ bay our actual bending stresses in the floor slab are only approximately 85% as high as the computations would show if allowances were made for the actual wheelbase and wheeltread distribution. In other words, by considering the truck as applying a concentrated load, we allow a slightly higher factor of safety than necessary.

From the above we find that we have a factor of 1½ to 1 due to the dynamic loading, and a factor of 2 to 1 for the concentrated load conditions, making an overall factor of 3 to 1 for the stresses in the floor slab imposed by a truck in operation, over that which would obtain on a uniformly loaded floor slab.

Calculating Support for Truck

Our next problem is to find what portion of the floor slab is devoted to carrying the weight of the loaded truck. This may be determined by considering the area of space devoted to the aisle in one bay. For example, if we assume a bay having 20′ x 20′ column spacing in which we allow an aisle 10′ wide, we would have an aisle area of 10 times 20 equals 200 sq. ft. of unloaded floor area in one bay devoted to support of truck. If the floor has a rated capacity of 250 lbs. per sq. ft. this would allow us to store a load of $250 \times 200 = 50{,}000$ lbs. of static load in this aisle space. This aisle space need only support the moving truck, hence we can determine the permissible loaded weight of the truck by taking 50,000 lbs. and dividing it by a factor of three, which equals 16,600 lbs. as the available floor capacity for the truck.

This calculation assumes that the area at either side of the trucking aisle is not loaded beyond the rated floor capacity, either with goods or production machinery. Two or more trucks could pass each other over this area in a given bay at one time, provided the combined weight of trucks did not exceed the computed total, which in the above example would be 16,600 lbs. This point is very important in considering floor capacities, and shows up more particularly in front of elevators where it is often found that one truck will be coming off the elevator before the second truck is run onto the elevator.

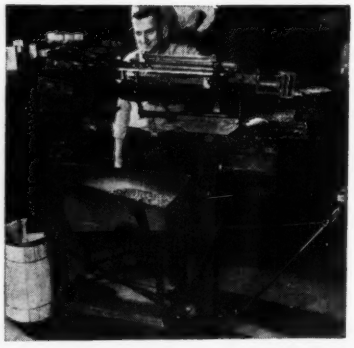
Approach to Elevators

For this reason, particular attention should be paid to the area in front of elevators when designing new buildings or reinforcing old buildings.

A further caution in connection with the floor slab in front of an elevator arises from the facts that: (1) it usually gets more traffic than other sections of the building, (2) the fatigue load at this spot is likely, therefore, to be greater, and accordingly, (3) the floor should have a higher factor of safety. In addition it is often found that the column spacing in front of an elevator is less than that for other parts of the building. The length of aisle in that particular bay is shorter and has a lesser total carrying capacity if the floor at that point is thinned down to give the same static capacity per sq. ft. as in other sections of the plant where the column spacing is normal. This condition, however, is somewhat offset by the fact that goods are seldom stored in such a bay. Where the entire bay can be devoted to supporting the weight of the loaded truck or trucks, the entire bay area may be used in the computations.

The foregoing obtains more particularly for the concrete slab type of floor construction, which, according to most architects, is one of the more desirable types of floor for buildings used as above described.

CORRECT QUANTITIES of small pieces are quickly determined at National Screw & Mfg. Co., Cleveland, with this portable counting scale. In order to determine the number of pieces in the platform hopper, enough pieces are placed in the small holder attached to the beam to bring the beam to a level position. If the scale is set for a 100 to 1 ratio



and there are 10 pieces in the small holder, the hopper contains 1000 pieces. Construction of the hopper with a sloping bottom simplifies emptying of the pieces into a keg after counting. A sliding gate across the pouring end holds the material in the hopper during the weighing operation. As a safety feature, a spring holds the towing handle off the floor when the scale is in use.

Where other constructions are employed, further studies must be made, which in some cases will involve the actual wheel loading. This is particularly true of certain wooden floors where only a few boards or planks may receive the entire load of a pair of wheels. Such a floor may be rated for a fairly heavy carrying capacity per square foot with a uniformly distributed load, but may not be capable of the concentrated loads produced by truck wheels. In such cases further computations (and possibly tests) may be indicated. An engineer-architect, in most such cases, could devise a reinforcing means (such as steel plates) to distribute the concentrated wheels loads over a greater number of planks.

Steel Beams and Thickness of Concrete

Where steel beams are part of the concrete floor construction it is possible that concentrated loading may produce a problem because the span of the beams may be less than the span of the bay or the columns. This reduces the area devoted to supporting the truck, and a detailed study should be made to allow for such a condition. Where such construction is used the thickness of the concrete would be less, and because of this lesser thickness the stresses in the concrete due to concentrated loading may be increased even though the space between these beams is relatively small.

To summarize, simple study can give an approximate indication of the weight of the loaded trucks which may be safely operated on a floor. When these computations indicate that the weight of the trucks proposed approach the maximum figures, a detailed study by a competent engineer should be made. If the weight of the loaded machines is comfortably below the maximum figures, and the building is in a good state of repair, it would be safe to apply a trucking system without such a detailed engineering study.

Data obtained from study conducted by C. S. Schroeder, Director of Engineering, The Yale & Towne Mfg. Co.

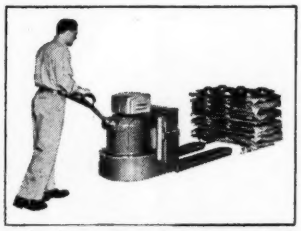
IT'S A NEW TOWMOTOR

ELECTRIC HAND-TRUCK

Moves Loads Faster, Easier, Safer!

PALLET HAND-TRUCK
MODEL "W"
Capacity: 4,000 lbs.

Control handle swings on 200° steering arc.



Forks slide easily under palletized load.

Here is the new Towmotor electric pallet hand-truck built to Towmotor's exacting engineering standards. Its compactness, maneuverability and well balanced design make it possible to operate the new Towmotor 25% faster than the average hand truck.* The steering handle is equipped with twin control buttons conveniently located for either right or left hand operation, which enable the operator to guide the truck from any angle. Other Towmotor Model "W" pallet hand-truck features include rapid hydraulic lift, easily detachable forks, positive traction power, 3-point suspension and differential-action trailer wheels. Write today for full information on this and other models in Towmotor's complete line of Fork Lift Trucks and Tractors.

*BY ACTUAL TEST WITH RATED LOAD.

SPECIAL TOWMOTOR

Safety Feature!

Immediately upon releasing the control handle of the Towmotor Model "W" Truck . . .

. . . the spring equipped, self return automatic turn-off switches cut the power supply to the motor.

. . . the heavy duty spring returns the handle to vertical position, instantly supplying the positive, quick-acting brake to the drive shaft.

. . . INSURING IMMEDIATE CUT OFF OF POWER AND POSITIVE STOPPING OF THE TRUCK.

TOWMOTOR CORPORATION
DIVISION 8, 1226 E. 152nd ST., CLEVELAND 10, OHIO
Representatives in All Principal Cities in the United States and Canada

TOWMOTOR
THE ONE-MAN-GANG
®

FORK LIFT TRUCKS *and* TRACTORS
RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

CONVEYOR RAILROAD

The world's longest belt conveyor is proposed to carry coal, ore and limestone 22 feet above ground from Lake Erie to the Ohio River.

THE longest belt conveyor in the world, 103 miles in length, will carry raw materials from Lorain, Ohio, on Lake Erie to East Liverpool on the Ohio River, if present proposals before the Ohio legislature are not snagged by strong opposition which has developed. It will be the first two-way cargo line ever constructed. Spur lines will serve Youngstown and Cleveland, comprising a total system of 130 miles.

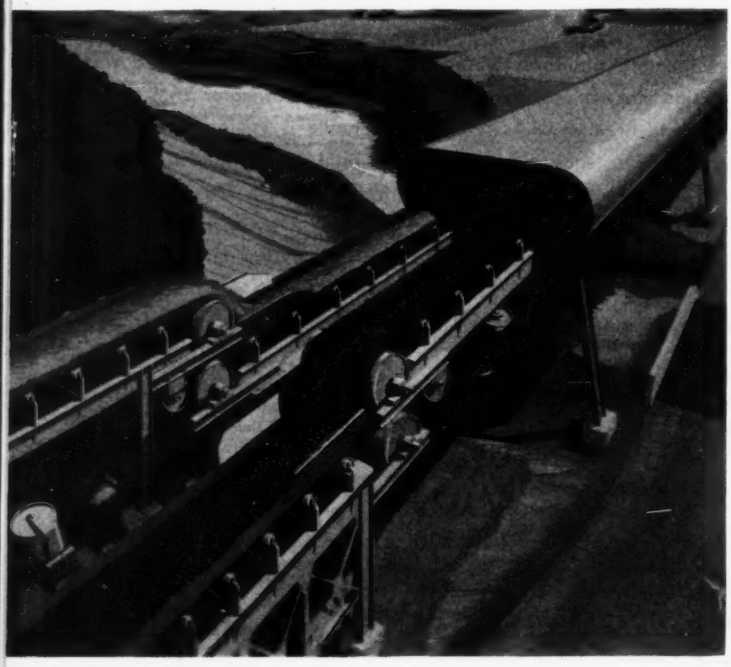
A bill authorizing the right of way for the installation is now before the Ohio legislature. An additional year will be necessary to complete final engineering studies. At a cost of $210,000,000, the system will save an estimated $20,000,000 to $45,000,000 annually (according to the volume carried) in freight rates on iron ore, limestone and coal.

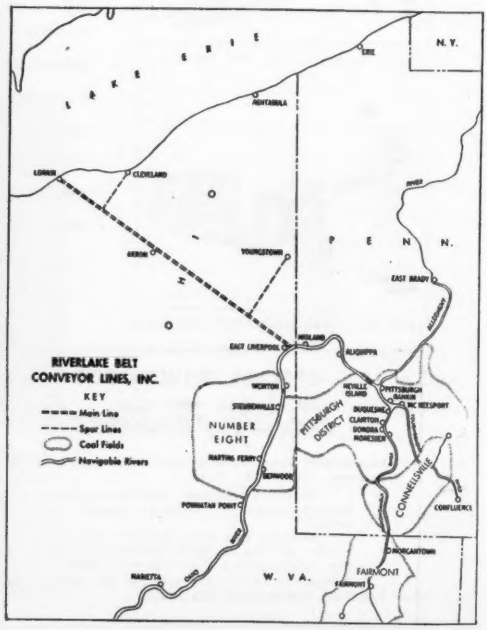
The elevated structure will have a minimum clearance of 22 feet and the metal gallery atop the steel supports will be fully enclosed. Electrically operated, the belt movements will be controlled by a push button system with an electric eye warning device able to locate distress points and stop the entire line immediately. A total of 172 flights, some of them more than a mile long, will be required on the 103-mile two-way main line. This will move coal north-bound over the 72-inch belt from the river at the rate of 600 feet per minute or 3400 tons per hour. The opposite or south-bound belt will carry iron ore at the same rate of speed, but because of the greater weight of the cargo, the volume will total 5400 tons per hour in a continuous flow over the 60-inch belt line.

151,000 tons of structural steel, 267 miles of rubber belting, 400,000 troughing idler units and 217 terminal power units will be needed for construction of this "conveyor railroad." Over 32 million man-hours will be required to construct the line and component parts.

Belt sizes planned include a 72-inch conveyor belt north of the Ohio River to the Youngstown spur point and a 60-inch line on northward to Lorain. The spur belts will be 42 inches in width. The conveyors will be noiseless, fumeless and smokeless and the belts will be driven from both the head and tail ends. Of interest is the placing of low-pressure pneumatic tires beneath the belts at the point of discharge between the flights. These will cushion the shock of transfer of material from one belt to the next, thereby greatly increasing belt life. Riverlake Belt Conveyor Lines, Inc., will construct and operate the system, if the project is approved.

PHOTO AT LEFT shows transfer points between two flights. Note elevated structure with fully enclosed metal gallery. Below, map of proposed conveyor route.

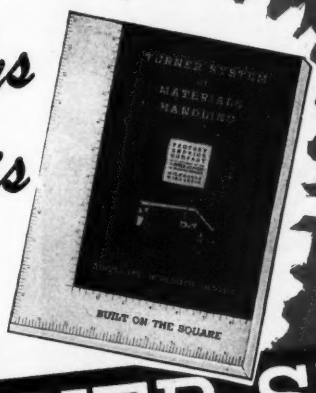


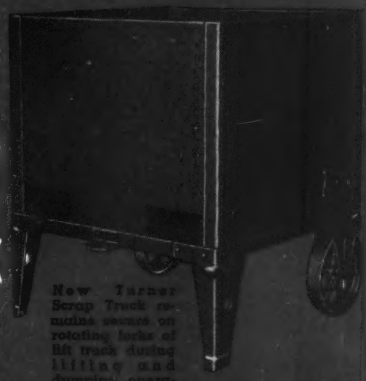


The Transport (8 types) is half-truck, half-platform . . . does the work of both at a substantial saving. Bin Sections, Pallets, Die Racks, Shelves or Superstructures are quickly movable on the Transport. (See below).

These rugged 8-way Pallets cut costs because they last for years, perform stacking miracles. Three types available — Wooden Deck, Floor Plate Deck and Flat Steel Deck.

It Pays to Get this Book on





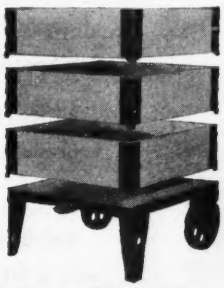
New Turner Scrap Truck remains secure on rotating forks of lift truck during lifting and dumping operations.

THE TURNER SYSTEM OF MATERIALS HANDLING

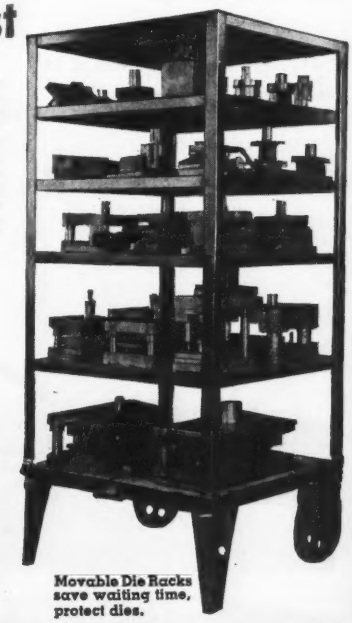
Know How to Get Bigger Savings and Greater Efficiency from Every Dollar You Invest

"DELIVER THE BIN AND SAVE THE HANDLING" with the Turner Transport which is moved by hand Jimmy, Power Lift Truck, Crane or Tractor.

The FREE Turner System Book describes the system and units used by Leaders of Industry in increasing numbers for 30 years — to save UP TO 50% IN FLOOR SPACE, LABOR AND EQUIPMENT COSTS. Our 60 DAY TRIAL PLAN enables you to PROVE savings in your own plant BEFORE you invest. Write at once— no salesman will call (except upon request).



Bin Sections (Wooden-side or All-steel) are removable for greatest efficiency when loading or unloading. Always the RIGHT SIZE bins.



Movable Die Racks save waiting time, protect dies.

FACTORY SERVICE COMPANY

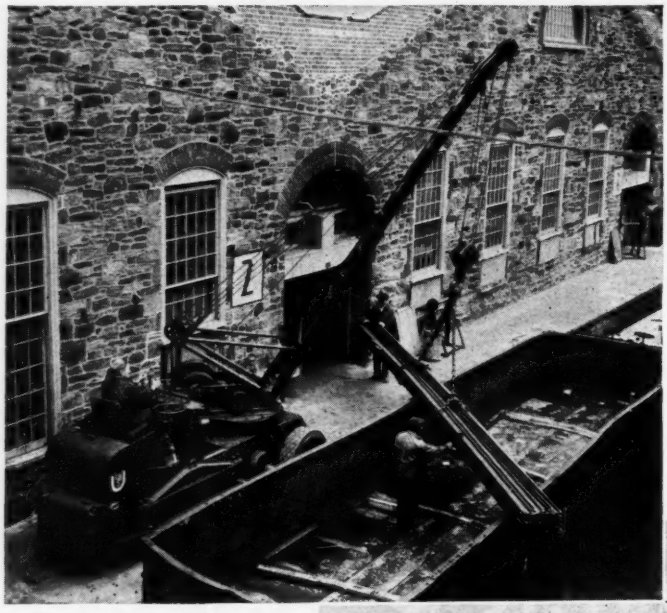
4607 NORTH TWENTY-FIRST STREET MILWAUKEE 9, WISCONSIN

Expedite MATERIAL HANDLING STORING—ASSEMBLING

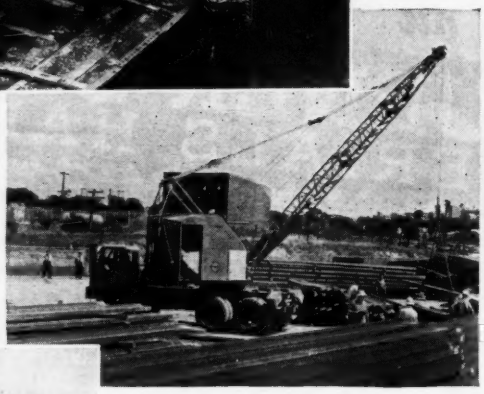
with

LINK-BELT SPEEDER

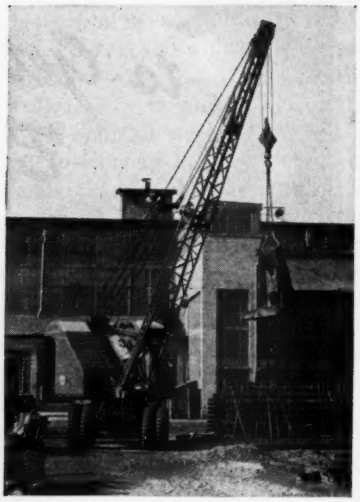
Shovel-Cranes



Cargocrane unloads strip steel at factory warehouse. Low slung and with telescopic boom, it can carry its load right into the building.



Zephyrcrane makes light work of unloading and piling poles.



UC-55 expedites handling of heavy steel castings.
HC-70 Truck-Crane in wide area storage yard. With speeds up to 30 m.p.h. the Truck-Crane cuts travel time to minimum.

Loose or bulk material, steel and lumber, product parts in course of assembly—you handle any or all of them effectively with Link-Belt Speeders.

Lifting attachments are quickly interchangeable to provide hook-block, grapple or clamshell bucket for any specific type of material.

Link-Belt Speeder wheel-mounted cranes range from the YC-9 with a lifting capacity up to 10 tons, to the HC-90 truck-crane with capacity of 25 tons, and boom lengths of 100 feet plus jib.

11,483

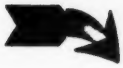
This book illustrates and describes many different applications of Link-Belt Speeders to material handling. You'll find helpful information and suggestions here — Send for a copy — NOW!

LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION
CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

FLOW ENGINEERING DATA PAGE



A new, regular feature designed to help the engineer and others responsible for material handling. The FLOW Engineering Data Page will cover a different category of equipment each month.

STANDARD LOAD RATINGS * *
FOR
INDUSTRIAL TRUCK AND TRAILER SOLID TIRES
(CURED-ON TYPE)

MAXIMUM SPEED 8 MILES PER HOUR

*TIRE SIZE	MAXIMUM LOAD
4 x 1½	170
5 x 1½	200
6 x 1½	230
6 x 1¾	280
7 x 1¾	320
5 x 1⅞	270
6 x 1⅞	310
5 x 2	290
6 x 2	340
7 x 2	380
8 x 2	420
9 x 2	460
6 x 2¼	390
7 x 2¼	440
6 x 2½	450
7 x 2½	510
8 x 2½	560
9 x 2½	610
10 x 2½	660
11 x 2½	710
12 x 2½	750
14 x 2½	850
16 x 2½	940
18 x 2½	1030
6 x 2¾	510
7 x 2¾	570
6 x 2⅝	480

*TIRE SIZE	MAXIMUM LOAD
6 x 3	570
7 x 3	640
8 x 3	700
9 x 3	770
10 x 3	830
11 x 3	890
12 x 3	950
14 x 3	1070
16 x 3	1180
18 x 3	1290
20 x 3	1400
24 x 3	1600
12 x 3½	1140
18 x 3½	1550
28 x 3½	2170
5¾ x 4	770
6 x 4	800
7 x 4	890
9 x 4	1080
10 x 4	1170
11 x 4	1260
12 x 4	1330
14 x 4	1510
16 x 4	1660
28 x 4	2540
5½ x 4½	850
6 x 4½	910
6½ x 4½	970
8 x 4½	1130

*TIRE SIZE	MAXIMUM LOAD
5½ x 5	960
6 x 5	1020
6½ x 5	1090
7 x 5	1150
8 x 5	1270
9 x 5	1390
10 x 5	1500
11 x 5	1620
12 x 5	1710
14 x 5	1940
16 x 5	2140
18 x 5	2330
20 x 5	2520
6 x 6	1250
7 x 6	1410
9 x 6	1700
10 x 6	1840
11 x 6	1980

*EXPLANATION OF "TIRE SIZE"

Number	Dimension (In.)	Tolerance
1st	Overall Tire Diameter	+.000"
2nd	Wheel Rim Width	—.031"

**Caster & Floor Truck Mfrs' Assn. Standard as adopted October 27, 1948

**Tire & Rim Assn. Standard as adopted October 29, 1948

STANDARD LOAD RATINGS * *
FOR
LIGHT DUTY CUSHION TIRES USED ON LUG BASE RIMS

MAXIMUM SPEED 5 MILES PER HOUR

TIRE SIZE	MAXIMUM LOAD Hollow	Solid
5 x 1.75	60	90
6 x 2.00	90	130
8 x 2.00	110	160
10 x 2.00	130	190
12 x 2.00	145	210
8 x 2.50	145	230
10 x 2.50	165	255
10 x 2.75	185	285
10 x 3.00	205	315
12 x 3.00	230	350
16 x 4.00	405	620
16½ x 4.00	405	620

RIM SIZE	MAXIMUM Tire Section
5 x 1.75	1.75
6 x 2.00	2.00
8 x 2.00	2.00
10 x 2.00	2.00
12 x 2.00	2.00
8 x 2.50	2.60
10 x 2.50	2.60
10 x 2.75	2.75
10 x 3.00	3.15
12 x 3.00	3.15
16 x 4.00	4.15
16 x 4.00	4.35

Note 1: For speeds of 8 miles per hour the above maximum loads are reduced 20%.

Note 2: In addition to the above Light Duty Tires there is a line of Heavy Duty Tires of the same dimensions which can be used with a 50% increase in maximum loads.

**Caster & Floor Truck Mfrs' Assn. Standard as adopted October 27, 1948

**Tire & Rim Assn. Standard as adopted October 29, 1948

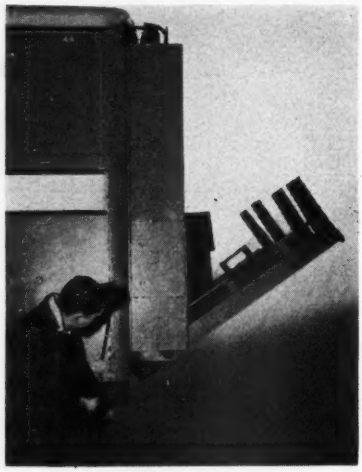
HYDRAULIC TAILGATES . . .

(Continued from page 24)

is being extended to other of the company's delivery trucks.

Individual Cases Not Touched

Shipments from the warehouse are of two types. 1. Full truck loads which go to master markets. 2. Less than truck loads sent to the smaller outlets in the food store chain. From the time the merchandise is palletized in the warehouse until it is on display in the store, the individual cases are not touched by hand. Here is the way it is done at Fisher's.



OPERATOR LOWERS hydraulic tail gate. It may rest at truck body level or on ground.

At the warehouse, the palletized loads are picked up by fork trucks and deposited on the delivery vehicle's tailgate. Here, the latter rests flush with the shipping dock, as shown. The merchandise is pushed into the truck with the stringers of the specially designed pallet riding the conveyor rollers. To prevent shifting during transit, steel clamps are applied.

At the retail store, the tailgate is swung out level with the truck bed and the pallet load is rolled onto it with the use of a steel hand pull unit. The gate is then lowered to ground level. A pallet hand-lift truck is run between two conveyor sections, and the load is raised and transported to the store stockroom. The same truck also moves the palletized merchandise to the selling

floor. This type of hand pallet truck was built specially for Fisher's use in this operation. The equipment has a six-inch lift instead of the usual four inches, in order to clear the conveyor rollers on the truck tailgate.

The elevator tailgate has a lifting capacity of 8,000 lbs., and an exact leveling control. The total lifting range is 78 inches, extending from trailer bed level to 24 inches below ground. This range is designed to accommodate below ground level receiving rooms. The photos show the hinged ramps over which the hand pallet truck rolls during unloading or loading. The tailgate is able to carry loads on either or both sides with equal ease. The pallet handling method in conjunction with this mobile conveyor has reduced unloading time considerably.

Double Benefits

These handling methods bring two-way operating advantages. The retail stores send back to the warehouse sizable palletized loads of empty bottles, damaged goods, and other returns. Savings in loading time and effort at the retail end are comparable to those obtained in the warehouse. In both cases, the handling of the full pallet loads results in greater safety, speed, and better housekeeping.

The safety of the operation is important from a damage loss standpoint. It is well known that rough handling of individual cases frequently results in damaged goods, especially from the delivery truck to the receiving point. Damage loss caused by the dropping of cases is avoided when entire pallet loads are lowered gradually to ground level, and then moved by truck to their desired location.

NEW 1949-1950 DIRECTORY

The first issue of the FLOW Directory of Material Handling Equipment and Accessories was received with great acclaim, and now orders are being accepted for the second, improved issue at $5 per copy. Distribution will be in mid-year of 1949. Several sections will be expanded and new ones added. Send your order now.

ONE SHEET AT A TIME:

The Costly Way!

BUNDLE HANDLING CUT COSTS TO A MINIMUM

By WAYNE E. HAMILTON
Plant Engineer, E. H. Sheldon & Co.
Muskegon, Michigan

This paper won second prize of $300 in the 1948 FLOW Cost Analysis Contest. An ingenious monorail jib serves as a removable bridge over a track spur for an electric hoist. At an unloading cost of $.28 per ton of steel the equipment is paying for itself at a fast rate.

THIS report is on the development of our monorail system for the unloading of sheet steel, which had always posed serious difficulties in handling. Our present system has almost completely eliminated the problem.

Previously all of the steel was unloaded one sheet at a time. Either the truck trailer or a flat car was parked at the dock and six men were assigned for its unloading. Two men untied the bundles on the truck and loaded factory dollies with the steel. Two other men pushed these loads through the shipping department onto the freight elevator. From here it was lowered to the shear room floor level, then alongside the proper storage pile where two other men

The Economics of the New Method

A look into the economics of this system brings out the following:

Material	*Cost*
3-Ton Hoist	$1,237.50
Jib Boom Crane	448.00
Sheet Grab	420.23
2 Cable Reels	253.04
Steel	705.96
Miscellaneous	140.07
Total	3,204.80
Labor	955.46
Sum Total	$4,160.26

In breaking down the labor costs for unloading steel under the old method the writer discovered quite a time variance. However we are on the safe side to state that it required six men one working day to unload a 20-ton load of steel at an average wage of $9.00 per man day.

The handling cost would figure:

$$\frac{6 \times \$9.00}{20} = \$2.70 \text{ per ton}$$

Under the present system there are also many variables due mainly to the condition of the steel when received. However, it is safe to estimate 1½ hrs. for 3 men to handle a full load at an average of $1.25 per hr., which figures:

$$\frac{3 \times 1.5 \times 1.25}{20} = \$.28 \text{ per ton (approx.)}$$

Total handling saving per ton = 2.70 — .28 = $2.42.

Total tons necessary for amortization of job.

$$\frac{4,160.26}{2.42} = 1719 \text{ tons.}$$

unloaded it one sheet at a time. This was the costly way!

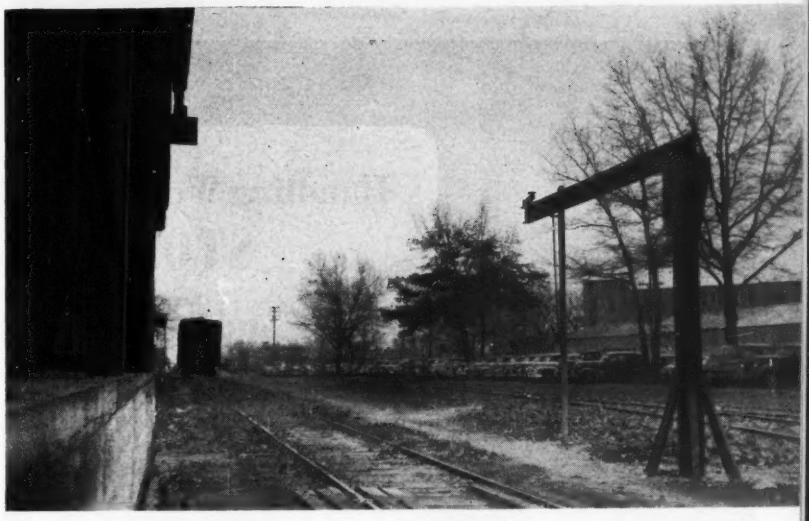
Old Method—Six Disadvantages

The more obvious faults with this procedure were as follows: 1. A truck load of steel would tie up valuable dock space at least one working day. 2. The flow of steel through the shipping department was counter to the normal flow of materials. This caused serious congestion and interfered with the timely shipment of crated products. 3. The demands on the freight elevator interrupted vital service to the rest of the floors and seriously hampered production. 4. In cold weather it was necessary to have the outside doorway open for extended intervals, which would permit freezing blasts to sweep through the entire end of the factory. This caused much dissatisfaction among the employees, and no little lost time by illness which resulted. 5. It became difficult to obtain highway truckers to bring in loads of steel, due to long tie-up of their equipment at destination. 6. The men assigned to unloading were generally "borrowed" from other departments, to the detriment of their own regularly assigned work.

Rotating Jib Beside Track Is Removable Monorail Bridge

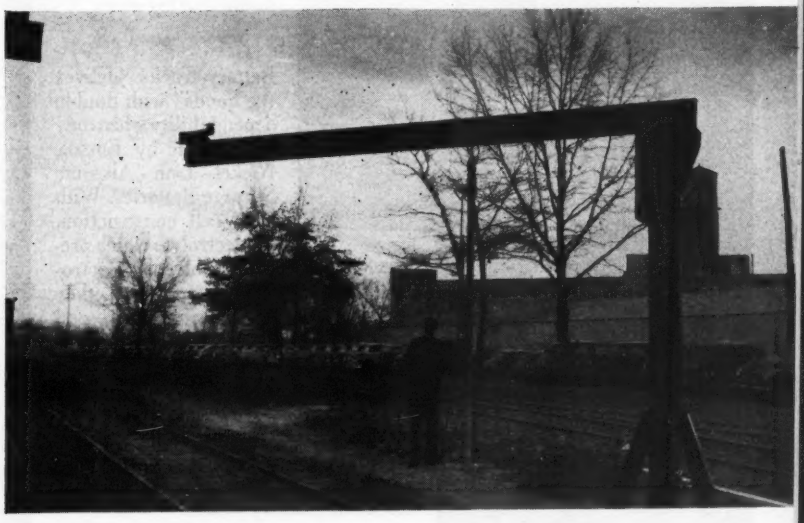
It was decided to install a monorail system which would run the length of the shear room over the storage area, then through a brick wall and continue through an unused section of the shipping department out on the dock and across the switch siding. The total distance was approximately 18 ft.

The track would have to be level its entire length, which limited the maximum height to the timber floor beams of the next floor. This would give us an 11-ft. clearance over the railroad siding. With the use of a low headroom trolley and hoist this would give us ample clearance for steel shipments by flat car, lowside gondola, or flat-bottom trucks. It became necessary to install an offset on the dock

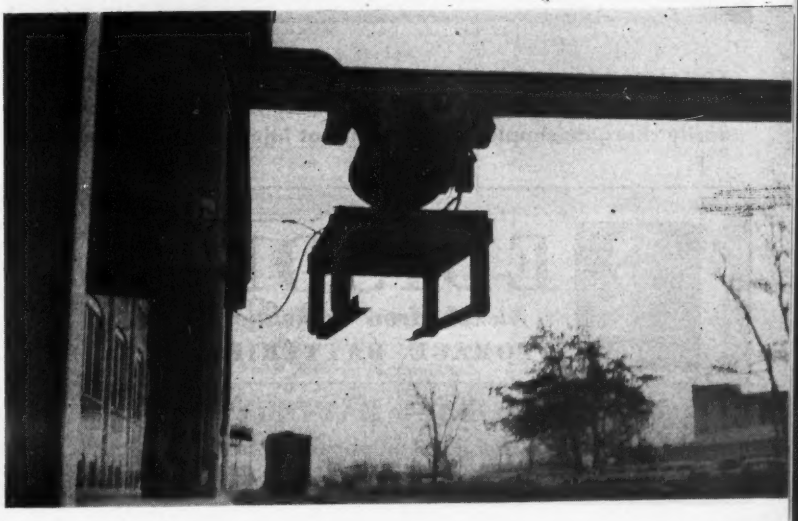


JIB BOOM at track is open and locked clear. ▲

UNLOCKED BOOM swings toward closed position. ▼



HOIST IN operating position on locked boom. ▼



before crossing the track so that the entire car would be available under the hoist from the time it was against the bumper until hand jacks moved it along the track under the pick up.

In order to accommodate truck shipments, suitable crossings were installed so that the trucks could drive down the switch and off again without difficulty.

Several methods of installing a removable monorail section across the track spur were considered. It was finally decided that a specially constructed jib boom crane would fill our needs. The jib was of standard 5-ton capacity construction, but the boom arm was 18 ft. long and made of 10″ I-beam. As a self-supporting structure this jib boom would have very small capacity, but when suitably connected to the permanent monorail its capacity was equal to any demands made on it.

No fastening device was obtainable commercially which would satisfactorily tie the boom to the monorail when swung into position. Hence one was developed which not only worked perfectly but was also of very rugged and simple construction.

A low headroom hoist of 3-ton capacity was installed which energized with two cable reels. One of these is installed approximately one quarter of the distance from each end of the monorail.

Factor of Safety, Other Points

This monorail has been in operation for more than eight months and the response and enthusiasm with which it is accepted is far beyond our expectations.

A load of steel properly bundled can now be unloaded in a matter of minutes, with little or no inconvenience to shipping facilities or production. Numerous shortcuts are being developed with every load.

We were not long in discovering that there is very little uniformity in the manner in which steel is shipped nowadays. It was not unusual to find the loads packed in

solid piles contrary to instructions. Again, the loads became loose and shifted all over the truck bottoms. In some instances the loads were piled in random sizes without regard to the fact that they would be picked up with a sheet grab. However, none of these faults proved too tough for the resources of the operators. When reports came in that it only required a quarter of an hour to unload 15,000 lbs. of steel it seemed unbelievable when we looked back at the methods of only a few months ago.

It is well to bring out the necessity of incorporating a large factor of safety in designing this type of handling equipment. In several instances loads of five tons were handled without difficulty or damage to equipment that is rated at three tons only. You can imagine the astonishment of the operators the first time they lowered such a load on a factory truck and watched its wheel and axles flatten out like a rug. No other one incident "sold" the facility to the plant personnel quite as quickly as that one.

Permission was readily obtained from both the State and Railroad authorities for this 11 ft. headroom clearance in the closed position.

Several hundred tons of steel have already been handled by this system. In some instances overloads approaching 100% were imposed. However it is with considerable gratification that we find no change in the original alignment.

NEW 1949-1950 DIRECTORY

The 1949-1950 FLOW Directory of Material Handling Equipment and Accessories will feature a number of improvements over the first issue. Included will be more pages, an expanded engineering data section, improved product data classification, and a new geographical and alphabetical "Who Sells It" section. An indispensable guide for material handling engineers, executives and purchasing agents. Orders at $5 per copy are being accepted now for midyear distribution.

G.E.'s General *Rubbish Handling* Program

How can various types of rubbish be classified? What services should be performed by the Salvage Department? What types of containers - - and carriers - - should be adopted? . . Some of the questions answered here by the author . . in the interest of plant cleanliness and safety.

By F. E. BLIVEN
Material Handling Engineer
General Electric Co., Erie, Pa.

CLOSELY related to scrap handling, which I discussed in FLOW for December, 1948, are the equipment and methods used for the collection and disposal of general rubbish. The handling of this debris is important because the subject is closely affiliated with plant cleanliness and safety.

Accordingly, we have consistently studied the handling of rubbish during the past decade. Figures indicate that such a plant as Erie Works which builds electrical apparatus in a large variety, produced at least one ton of rubbish per hourly operator in prewar years, and double that tonnage during the years of World War II. The present weight handled at Erie Works is 36,000 net tons per year.

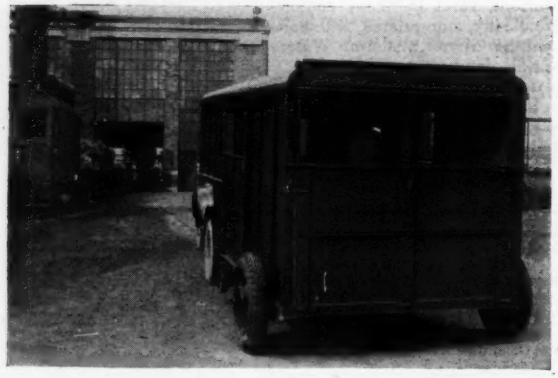
We classify rubbish under the following six headings. 1. General litter. 2. Wash room accumulations. 3. Insulation wastes. 4. Boxing, crate lumber, skids, excelsior waste, and related items. 5. Sawdust. 6. Corrugated packing boxes and containers from receiving departments.

Corresponding services performed by the Salvage Division are as follows. 1. Return to original owner of various returnable containers, such as drums, paint pails, acid carboys and gas containers. 2. Cable reels and spools, returnable mica boxes, etc. 3. Handling of such special bagged scrap items as blue print paper. 4. Recirculating between departments such containers as tote boxes, accumulating trays and pallets.

Special-Purpose Vehicles for Rubbish

A standard shop container barrel is used throughout the Works to accumulate natural waste, spoilage and other items. These containers can be expeditiously loaded on industrial flat cars within the crane ways located in all the buildings. The barrels belonging to each building are identified by a color band, and in this manner we can trace back any difficulty that may be encountered with the rubbish and litter. The use of these standard containers results in a neat appearance within the departments as well as in speedy handling and disposal of the rubbish. No other containers are permitted for rubbish handling.

(Turn to page 70)



RUBBISH TRAILER has full screening to prevent paper from blowing about on windy days.

NEWEST TYPE box rubbish truck containing refuse, wood and cartons is hauled by tractor.

Take the Wait Out of Weighing!

There's no hold-up of production with Fairbanks-Morse Printomatic Weighers. As an integral part of the materials handling system, these time-saving scales automatically record weights on a ticket or tape as material moves along the production lines. Printomatic Weighers can control materials handling flow, batching, processing and production machinery. Why not have a Fairbanks-Morse weighing expert show you how Printomatic can take the wait out of weighing in your plant? Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS
GENERATORS • STOKERS • RAILROAD MOTOR CARS AND STANDPIPES • FARM EQUIPMENT • MAGNETOS

INSTITUTE AND ASSOCIATION ACTIVITIES

THE Material Handling Institute, Inc., Pittsburgh, has announced that the following companies have become members of the Institute. The Prime Mover Division of the Bell Aircraft Corp. —Leston P. Faneuf, manager, is the official company representative; the Jervis B. Webb Co. — Jervis C. Webb, treasurer and general manager, is the representative; The Magnesium Co. of America— Miles L. Abel, vice president, representative.

E. W. Mikels
President, Indiana Materials Handling Society

T. E. Parish
President, Houston Chapter Material Handling Institute

AT A DINNER conference held at the Newark Athletic Club, a group of specialists in material handling voted to form a material handling organization.

Guests and speakers were J. B. McGinn, president, and C. F. Gross, secretary and treasurer of the Material Handling Society of Philadelphia; Samuel Gibb, president of the Material Handling Institute; and A. Ferdon, Ferdon Equipment Co. Temporary officers nominated were: chairman, R. A. McDonough,

MANFRED SCHUELER, editor of FLOW Magazine, was the speaker at the March meeting of the Detroit Chapter of the Material Handling Institute. His subject was, "The Money Side of Material Handling." The April 18

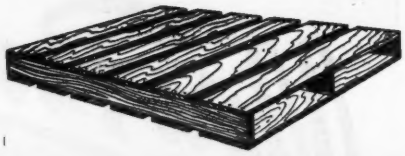
meeting will hear C. F. Kells of the Electric Industrial Truck Association, talk on "Practical Considerations in Applying Unit Load Methods."

THE following men were selected as committee chairmen of The Material Handling Institute for 1949 at the recent Board of Directors meeting in Cleveland. Asheville Program Committee, H. A. Carter, The Geneva Metal Wheel Co.; Chapter Committee, J. W. Wunsch, Silent Hoist & Crane Co.; Educational Committee, John G. Bucuss, Acme Steel Co.; Membership Committee, W. A. Meddick, The Elwell-Parker Electric Co.; Planning Committee, W. C. Stuebing, Sr., Lift Trucks Inc.; Publicity Committee, L. West Shea, The Union Metal Mfg. Co.; Show Committee, L. J. Kline, The Mercury Mfg. Co.

APPROXIMATELY 100 members and guests of the Northeastern Ohio Chapter, Cleveland, heard Ezra W. Clark speak on "The Effect of Modern Material Handling Methods on Production & Costs." Clark was formerly vice president of the Clark Equipment Co., and is now a business counsellor and consultant on material handling methods. A question and answer period concluded the meeting.

THE March meeting of the Indiana Material Handling Society, Indianapolis, heard E. D. Mayo, assistant superintendent, and R. B. Light, material handling engineer of The Upjohn Co. The talk included how inventory levels affect warehouse requirements; how flow of raw materials, production schedules, and distribution policies may stabilize or effect peaks in material handling work loads. The April 11 meeting will feature W. H. Ottt, Jr., general traffic manager of the Kraft Foods Co. He will speak on "Transporta-

(Turn to page 61)

ON THE  PALLET

NEWS • VIEWS • TRENDS

MATERIAL Handling in Textile Mills was the subject of a talk given by G. T. Moore of the Rudel Machinery Co., Ltd., Montreal, Quebec. It was delivered at the seminar of the Textile Technical Federation of Canada, in Kinston, Ontario. The theme of this paper was how to secure greater efficiency in the handling of the textile raw materials, yarns, etc. Some of the topics covered were: trends in material handling; applications in textile mills; the movement of yarn; handling of warps and loom beams; advantages of automatic cleaning; and twisting, spooling, and warping.

HIGHWAY Equipment Co. announces completion of a new 60′ x 100′ storage and warehouse building adjacent to its property in Pittsburgh. According to D. L. Reynolds, president, the company has also added one-half acre to its yard space and contemplates further building additions as soon as conditions warrant. Included among the lines carried by the company are Allis-Chalmers, Baker, Hough, Wayne Crane, and Lima shovels, cranes and draglines.

OVER 100 people registered for the Material Handling Conference held at Purdue University, February 21 and 22. The sessions were sponsored jointly by the Department of General Engineering and Technical Division of the University, the Indiana and Midwest Material Handling Societies, and the Material Handling Institute. It is believed to be the first such conference at any university in the country. The topics of discussion were material handling costs and space utilization. Included among the talks were "Management Looks At Material Handling," by L. C. Backart of the Rapids-Standard Co.; "The Production Problems of Material Handling," by Robert Brady of the Ingersoll Steel Division of Borg-Warner Corp.; "Determination of Material Handling Costs," by George B. Heddendorf, Babson Institute; "Sources of Information on Material Handling," by R. Kennedy Hanson, secretary of the Material Handling Institute; "Space Utilization and Control," W. W. Phillips, Eli Lilly and Co.; "Packaging and Material Handling," R. W. Mallick, consultant.

IN THE FIRST exchange of its kind, two factory workers, one in the United States and the other in England, will trade jobs and living conditions for a month so that they can tell their fellow workers in similar factories what goes on in the two countries. Both plants make fluorescent lamps. The American girl chosen is Mary Uglianitza who works in the Duro Test Corp. plant at North Bergen, N. J. The girls will do the same work they do at the home factory, receive the prevailing pay rate and subscribe to the rules and regulations of the plant in which they work.

THE Anchor Steel & Conveyor Co. has moved its offices and plant to Dearborn, Michigan. The new plant will have all storage inside the building with a railroad spur to service this area. The latest in material handling equipment has been incorporated into the layout. The company manufactures monorail conveyors, belt, slat and quench conveyors, and other material handling equipment.

DRAKE, Startzman, Sheahan, Barclay, Inc., distribution and material handling consultants, formerly at 50 Church St., New York, have opened a new office, Suite 3030, Grand Central Terminal Bldg., 70 East 45 St., New York.

THE Society of Industrial Packaging and Material Handling Engineers, National Professional Group, has announced plans to move its annual Industrial Packaging and Material Handling Exposition from Chicago to Detroit. It will be held at Convention Hall, October 4 through 7. This marks the first time, since its organization, that the show will be held outside of Chicago. The Society will again conduct a Packaging and Material Handling Institute in cooperation with the Wayne University School of Business Administration. The sessions will be conducted each morning during the week of the Exposition and will adjourn so that the "students" can attend the show during the afternoon and evening. A series of field trips through various Detroit factories is also planned.

J. W. Greer Co. has announced the sale of their wire belt division to the Wire Belt Co. of America. The sale of this division was due in part to Greer's desire to concentrate on its expansion of the manufacture of its continuous production machinery. The Wire Belt Co. formerly located in Baltimore, will now occupy new quarters in Cambridge, Mass.

MEN IN THE NEWS

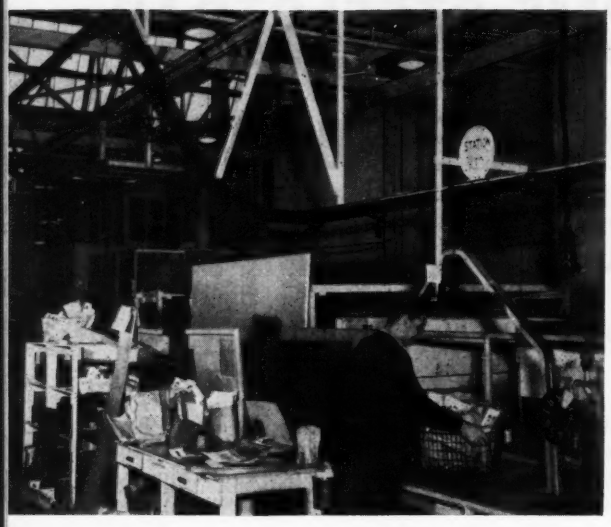
NEWMAN L. SMITH has been elected president of the Airquipment Co. and its wholly owned subsidiary Aerol Co., Inc. Smith also is a director of both companies. He succeeds B. W. de Guichard who is retiring. Smith became Airquipment's vice president and a director in 1946.

ROBERT H. MORSE JR., vice president in charge of operations, has announced the appointment of Louis R. Gaiennie as director of personnel of Fairbanks, Morse & Co. Gaiennie, who will make his headquarters at the Beloit, Wis., plant, will be available for consultation concerning personnel matters for all plants and branch houses of the company.

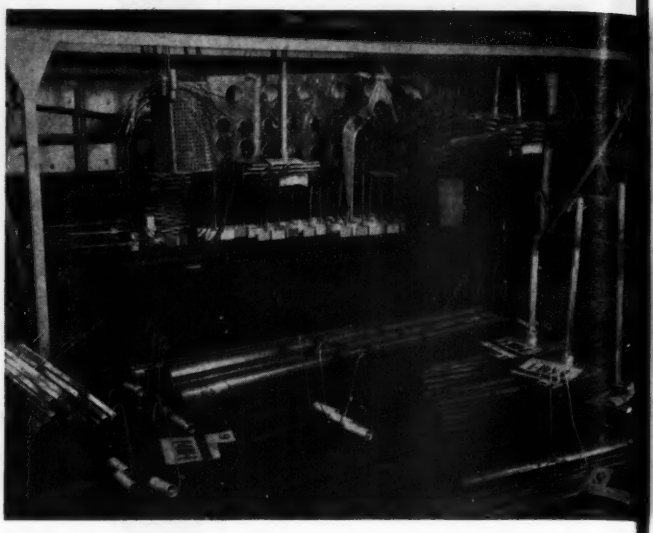
GEORGE R. BROCKWAY has been been elected vice president in charge of sales for The Rapids-Standard Co., Inc., according to an announcement by James R. Sebastian, president and general manager. Included among the officers who were recently re-elected to positions in the company are Lloyd C. Backart, chairman of the board; James R. Sebastian, president and general manager; Paul F. Millett, vice president; Russell A. Inwood, manufacturing and engineering vice president; Robert L. Gunnell, purchasing vice president; Howard R. Pearl, eastern regional vice president; and Roger S. Calvert, secretary and treasurer.

CHARLES E. FRANKS, president of The Wayne Pump Co., recently anounced the appointment of William J. Joyce, Jr., as head of the Wayne research laboratories. He was formerly chief engineer of research of Raybestos Manhattan, Inc.

HARRY W. BEEDLE, former manager of the Boston branch, The Electric Storage Battery Co., died recently. He was 69 years old, and had retired last June. Beedle started with Exide in 1900 in the company's commercial laboratory in Philadelphia. In 1916 he was sent to the Boston branch as a sales engineer.



RPLANE PARTS arrive for anodizing, then . . .



ARE RACKED, hung on transfer rack for . . .

MONORAIL CRANES ON TURNTABLES

MONORAIL CRANES AND ACCESSORIES

By WILLIAM BRESNICK
Process Engineer
Glenn L. Martin Co., Baltimore, Md.

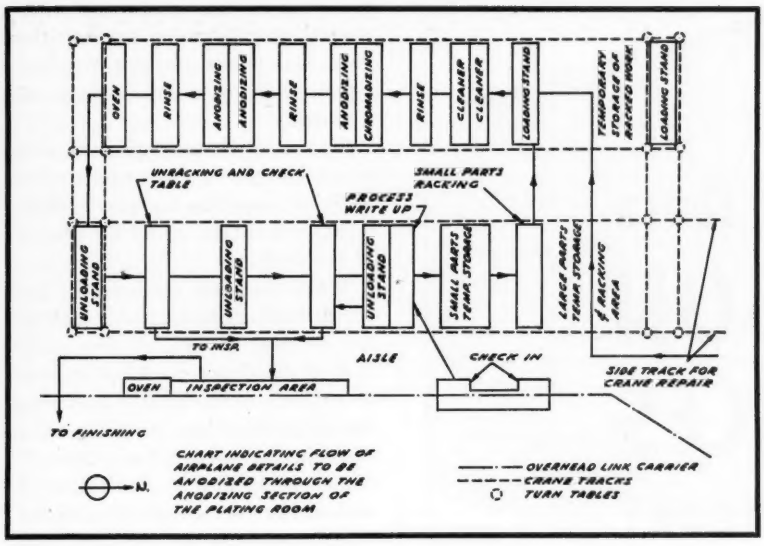
These monorail cranes travel longitudinally and laterally over this anodizing department—via quadruple turntables that operate in unison. Believed to be the first installation of its kind.

THE Martin-built Caroline Mars, the largest flying boat in active service today, recently established flight and weight records traveling non-stop from Hawaii to Chicago. The widespread publicity reflected favorably on our company, which is a manufacturer of military and commercial planes. Behind these celebrities of the airways are the unheralded day-to-day plant operations, which make such planes as the Caroline Mars and the Martin 2-0-2 possible.

An example of such a process in our plant is the anodizing operation, which produces a corrosion resistant surface on aluminum alloys in conjunction with finishing operations. The items treated are airplane parts in numerous shapes and sizes. These arrive in our plating department (where the anodizing tanks are located) from inspection by chain conveyor.

From Conveyor to Monorail Crane

As one of the photos shows, the work carriers are of the single tray type, which are spaced on 16′ centers. The dimensions are 30″ x 42″, with a capacity of 200 pounds per tray. The continuous conveyor supplies parts to several departments, and a dial system is used to identify the departments in which the work is to be taken off from the arriving carriers. The circular dial face consists of numbered segments which correspond to departmental numbers. A hand is set at the loading point to indicate the destination. Parts too large or heavy for the conveyor carriers are delivered by powered platform trucks.



RECTANGULAR craneway with four sets of turntables at each corner of the layout.

The conveyor dips at the check-in station, which is located in the east section of the room. The arriving parts are here segregated as to type of process (cadmium, chrome or magnesium treatments, for example). Material to be anodized is routed west across the room, where it is racked for anodizing in an area covered by monorail cranes.

Three types of work racks have been developed for carrying the parts through the treating tanks which are 20 ft. long, 4 ft. deep and 3 ft. wide. Small forgings and castings are placed in perforated metal baskets. Thin, flat shapes are racked up in springs. Larger items travel through the anodizing cycle in bar-type racks utilizing spring clamps to maintain positive contact between the racked parts. All racks are made of the same material as the work—such as 24ST aluminum alloy—due to the nature of the process.

Monorail Crane Dipping

The anodizing department takes up a space which is 52′ x 112′. This area of 5824 square feet is covered by two dual monorail tracks on which two cranes operate, the transfer from one parallel track to the other being accomplished by a turntable arrangement. This is sketched in the accompanying flow diagram.

The flow through the tanks is from north to south, with a stand for the transfer rack at the start of the line. The transfer rack is 54″ wide and 20′ long, with crossbars at intervals from which the loaded work racks are suspended. The bars are integrally made of anode bus bars so that when a transfer is set down on a tank it automatically makes contact with the electrical system. The work thus suspended in the tank becomes the anode from which the process derives its name.

The two double girder monorail cranes are of one-ton capacity and pendant-controlled. Ten tanks set up in line serve for cleaning, rinsing and anodizing. The work is lifted off the stand at the start of the line, and the crane operator

CRANE DIPPING. Lateral travel of crane is . . .

VIA FOUR turntables operating in unison.

performs all immersion and withdrawal operations by pushing the control buttons on the pendant panel. The cycle takes about 45 minutes.

The two cranes operate with eight transfer racks, which give sufficient capacity for uninterrupted operation through all the phases of the cycle.

When the crane removes the finished work from the last tank it has reached the wall at the south end of the department. It cannot travel back to the loading area over the same track because the second crane is transporting loads through the tanks behind it. As indicated earlier, the transfer to the parallel return track is accomplished by means of four turntables, one serving for each of the crane's four swivel trolleys. The turntables operate in unison—it is believed that this was the first installation of its kind—and are controlled from a separate wall switch. A locking device, operated by a limit switch, is a safety feature which prevents the turning of the tables before the crane is properly positioned.

The tables are revolved to change the direction of the swivel trolleys so that the crane can be moved across a lateral track onto another set of turntables which are connected to the second parallel track for return.

The return track extends over three stands for receiving the finished work. This is the unloading and take-down area. As the crane passes overhead to one stand or another the operator rings a bell to signal the unloading workers to step out of the way as the overhead load approaches.

When the anodized work is dropped on one of the stands the crane picks up an empty transfer rack and continues to the north end of the overhead system to a third set of turntables. The latter again align the swivel trolleys with a lateral track and thence onto a fourth set of turntables which return the crane to its starting position. Thus the cranes travel over the track system which forms a rectangle.

The present operation has given satisfactory service for several years. The turntable arrangement enables the cranes to travel longitudinally and laterally over the area, thus contributing to maximum production per square foot of available manufacturing space. Under the previous setup, all loading and unloading of the tanks was done by hand. This tended to bring operators in contact with chromic acid solutions, which was not desirable from the standpoint of safe practice.

Handling by monorail crane has changed the former physical carrying and lifting tasks into an effortless push-button operation, and the operator is at a reasonable distance from the work. One crane operator serves several tanks at one time.

The handling of parts through an anodizing system is a far cry from completed six-jet army bombers of which Martin has recently delivered the first one—but some of its parts were borne by monorail through this anodizing cycle before they became airborne.

CINDER CRUSHING . . .

(Continued from page 23)

carried around the pulley, and drop into a bin below after passing the magnetic field.

The cinders are discharged onto two 3/8" x 3/4" vibrating screens mounted in tandem for greater capacity. (If the upper screen should be clogged, the material slides onto the lower screen.) The screened cinders are fed via chute to Conveyor Line 4, which delivers them to the stockpile. Line 4 consists of two 60-foot portable belt conveyors (all belts are troughed). The stockpile to which the cinders are fed is roughly semi-circular in shape. The two portable conveyors may be arranged in line when delivering to a far point, or only one portable unit need be used when the discharge point is nearer.

The raw cinders which are too large to pass through the screens are carried to the crusher. The conveying medium for this purpose is Line 2, an 18" x 25' rubberized belt, which feeds directly from above to the crusher. The wheels shown in one of the photos weigh five tons each, as mentioned previously, are idler wheels operated by friction (the bed plate revolves thus driving the wheels.) The The wheels are set at a given height above the bed plate (carrying the cinders) as determined by the crushing action desired.

The crushed material drops onto Conveyor No. 3, which delivers via chute to Conveyor No. 1. The rest of the cycle has been described previously; the cinders pass over the vibrating screens, thence to the stock pile via Conveyor No. 4.

The entire operation is accomplished by means of the four belt lines of the closed system. No piece can leave the system until small enough to pass through the screens.

From Stockpile to Block Plant

When needed for production in the nearby block-making plant, the cinders are loaded by portable conveyor into a dump truck. One

of the photos shows the troughed belt conveyor leading from the receiving pit to the overhead hoppers installed over the block-making machines in the plant. A few details may also be of interest in connection with this phase of the material flow. The pit has a capacity of about 20 cubic yards. In the plant, bin indicators show both the "low" and "high" level. If the material in the bins drop below a certain point, a light flashes on a panel installed near the pit. In loading the bins, another set of lights signals the operator when the necessary quantity has been reached.

From the discharge end of the conveyor, a swing chute directs the flow into any one of three bins. This chute is controlled from the yard by a series of cables which are operated by levers. Thus the flow is conveniently controlled from the yard, and the climb to the top of 200-foot catwalk is avoided. This 20" troughed belt delivers approximately one ton of crushed cinders per minute to the bins.

As mentioned previously, by installing wider conveyor belts, we plan to balance the feeding capacity with the crushing capacity. This will enable us to operate the crushing plant fewer hours, and at the same time afford us greater daily production than at present. An auxiliary piece of equipment, a jaw crusher, may also be incorporated in the system. It will be spotted behind Conveyor No. 2 (which takes the coarse material to the crusher), and will be used for the primary crushing of certain scrap material (too heavy for the screens) before it is sent to the crusher. These are the only refinements we have found desirable in the three years of excellent service we have had from our cinder crushing plant.

SAFETY STANDARDS FOR CRANES AND HOISTS

By ERLE M. HAYS

Crane and Bridge Department
Dravo Corporation
Pittsburgh, Pennsylvania

From a paper presented to the Materials Handling Machinery Manufacturers Conference held at the Westinghouse Electric Corporation, Buffalo, New York.

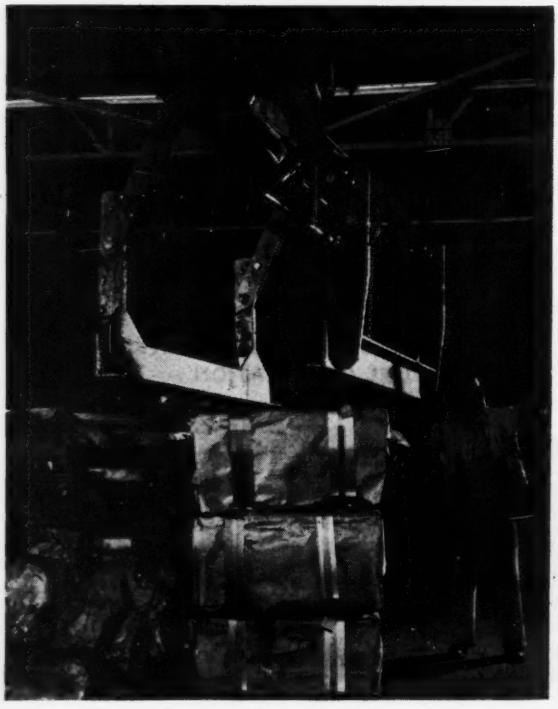
The expanding use of mechanical equipment for handling materials has created a challenge to both builders and users to determine if safety codes now adopted cover in their scope all the many types of material handling equipment and if improvements in the existing code requirements are needed.

MATERIALS handling equipment may be classified under the following general types:

(1) Cranes, (2) Conveyors, (3) Trucks, (4) Lifts and Hoists, (5) Tractors and Trailers, and (6) Mono-rail Systems.

It is the purpose of this article to discuss existing electrical codes which apply to heavy material handling equipment such as cranes, whirlers, and bridges and to present other safety regulations which may be desired by the Industry as additions to the present codes. The need of establishing standard recommended practices to follow in the design of safe material handling equipment, which would be used in conjunction with existing safety codes, will also be discussed.

A 15-ton cab-operated overhead traveling crane with a sheet lifter unloads sheet steel from gondola cars. Each bundle weighs 10,000 lb.



A jib crane with an electric hoist is used to place finished gear in a crate preparatory to sealing and shipping.

The American Standards Association Safety Code B-30.2 for Cranes, Derricks and Hoists, which was adopted and published by the Association in 1943, has given to the Industry a most valuable coordinated set of definitions and rules to use as a guide in the design of safe equipment. The committee which developed the code has done a monumental job. Its effects have already been measured by the In-

CHECK FOR SAFETY:

1. **Hoist Brakes**
2. **Bridge Brakes**
3. **Trolley Brakes**
4. **Slewing Brakes**
5. **Trolley Bumpers**
6. **Power Disconnects**
7. **Work Loads**
8. **Electrical Installations**
9. **Operator Training**

dustry. It is recognized that there should always be a certain amount of fluidity in any set of standards —that changes will come about because of further study and experience. The suggestions which I am, in all humility, putting forth in this paper stem from this point of view and a strong personal conviction that our approach should always be dynamic rather than static.

Since the adoption of this code, purchasers' specifications for equipment of this type have required that the design must conform to these rules. A large majority of these mandatory and advisory rules are explicit and it is proposed only to offer comment on a few of the rules which have been subject to question by builders and users.

The code requirements for hoist brakes are plainly stated; however, there have been occasions where interpretations have been different from the generally accepted interpretation. Quoting Section 105, Part 1051 — "Two Brakes Required"

"(a) Each independent hoisting unit of a crane shall be equipped with two braking means except worm geared hoist, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction.

(b) One brake shall be applied directly to the motor shaft or some part of the reducing gear and may be either electrically operated or mechanical.

(c) The other brake may be either mechanical or electrical. If mechanical, it shall lock the load when hoisting is stopped, and shall also control the speed during lowering to prevent undue acceleration.

Electric dynamic braking for direct current and electric braking for alternating current hoists may be used to control the lowering speed."

Electric Brakes

In the past few years it has been noted in a number of specifications of both builders and users for a single-drum electric hoist to be used on cranes, whirlers or bridges that the brake requirements specify the use

of three braking means for the hoist—a mechanical brake, an electrical brake, and dynamic braking for direct current hoist or electric braking for alternating current hoist. The term electric brake means to a large majority of engineers, designers, mechanics, etc., a friction type brake actuated by electric means. Due to this understanding on the part of many, these rules are frequently interpreted as a requirement for two friction type brakes on each hoist as well as the use of electric dynamic braking for direct current hoist or electric braking for alternating current hoist.

Section 6 of the Code clearly defines an electric brake as "an electric motor acting as a brake by regenerative, counter torque or dynamic means." It is suggested that perhaps a repetition of this definition in Section 105 would aid in a clearer interpretation of this rule on the requirements for two brakes.

On certain special cranes, however, the code requires that three braking means be provided. Quoting Section 115, Part 1154—"Ingot pouring cranes shall be provided with a brake in addition to those specified in Section 105, which alone shall have sufficient torque to sustain at least the rated load." In addition to the ingot pouring cranes, there may be other special applications of hoist drives where to provide adequate safety an additional brake is required. For example, a whirler crane with individual motor driven hoist, a mechanical applied brake in addition to the electrically operated brake and the electric brake may be required to allow for the safe lowering of the load in the case of electric power failure.

Paragraph 1058 of the Code covers brakes for bridge, trolley and slewing motions. Quotation from this code—

"(a) On cage operated cranes with the cage mounted on the bridge girders, a foot brake to properly retard and stop the motion of the bridge shall be installed.

(a) Brakes for retarding the motion of the bridge shall be capable of retarding at the rate of one foot per second while full load is being carried.

(c) The slewing mechanism should be provided with a brake or lock having equal holding power in either direction. The lever operating this brake or lock should have a device for locking in the holding positions."

Part (c) offers an advisory rule for a brake installation on the slewing mechanism. It is believed that it would be desirable to change this to a mandatory rule which would require the use of either a mechanical brake or an electrically operated brake. It would also be desirable that a standard recommended practice be established which would require that braking torques be limited to provide a retarding rate which would not cause excessive swinging of the load.

Brakes for Trolley Travel

It will be noted that the rules just quoted do not specifically cover brakes for trolley travel. It is suggested that an addition to the code be made to require the use of a mechanical or electrically operated brake on trolley motion and to establish a recommended practice which would limit the retarding torque to assure no wheel slippage or excessive load swing.

Trolleys on material handling bridges are today being operated at speeds up to and exceeding 1,000 feet per minute. Section 114, Paragraph 1141 states the requirement of trolley buffers and bumpers—

"(a) A bumper shall be provided at each end of the trolley travel. It should be fastened to the bridge girder or if the rail is prevented from sliding lengthwise, it may be fastened to the rail.

(b) A bumper engaging the tread of the wheel shall be of a height at least equal to the radius of the wheel. Bumpers engaging other parts of the crane are acceptable.

(c) If there is more than one trolley on the same bridge girders, buffers of cushioning devices shall be placed between the trolleys."

For high speed trolleys this code requirement alone is not adequate. It therefore is recommended that additional safety rules be included in the codes to assure safety. A limit switch or switches should be provided in each direction of travel near the end limit of travel which, when operated, would establish retarding torque to the trolley drive so as to assure a slow-down of travel speed to a value which would allow the trolley to hit the end buffer or bumper without causing damage to the equipment and operator.

If limit switch protection is not provided then it is recommended that buffers be required at each end of travel which will stop the trolley when traveling at full speed without causing damage to the

equipment and operator. It would be, of course, desirable to provide both the limit switch protection and the buffers.

Power Disconnects

A subject often discussed by both builders and users is power disconnect means for cranes being located at the operator's station. Paragrapah 1045-a of the American Standards Association Codes states, "On cage operated cranes an emergency switch shall be located within easy reach of the operator for disconnecting the power supply." The 1947 National Electric Code, Paragraph 6132, says "if cranes are operated from cages or cabs, a motor switch or circuit breaker shall be provided in the leads from the runway contact conductors. The switch or circuit breaker shall be in the cage or cab or mounted on the bridge and operable from the cage or cab when the trolley is at one end of the bridge."

The American Standard Association rule is interpreted by the Industry to allow either the use of a switch, breaker, or contactor. A revision to this code is suggested to include all these accepted disconnects. The question is often raised that if an electrically operated breaker or contactor is used, can it be mounted at some point away from the operator's station with only its control pushbutton at the station. There are many installations of this type which are giving dependable service. The modern trend is to a small full vision operator's cab. On cranes where the disconnect must have large current ratings, the installation of the disconnect at the operator's station is not always feasible. It is the writer's opinion that a full vision operator's cab is desired to insure safe operation and pushbutton operation of remote power disconnects should be allowed.

The National Electric Code permits the installation of the disconnect on the bridge being operable only when the trolley is at one end of the bridge. The writer believes

that a pushbutton operated electric disconnect with the pushbutton in the trolley cab would be a safer installation.

The American Standards Association code establishes an operating rule which states "a crane, derrick, or hoist shall not be loaded beyond the safe working load." In the design of electrically operated equipment, both the equipment builder and the electrical industry have made marked strides in their designs to limit the loading on the machine. By careful selection of the motor size and with the use of semi-magnetic or magnetic motor controllers, motor overload protection is obtained which provides partial safety protection against overloading the equipment. In some instances it has been found that the operator of the equipment or others have altered the controller's proper adjustment to allow for the lift of overload or for increasing the machine operating time by providing faster acceleration. Such practice, of course, destroys the safety protection which was designed into the equipment. It is suggested that an addition to the code rules be made which would require that electrical controllers be installed in a locked compartment or enclosures and access to be allowed only for authorized maintenance.

Mobile Cranes

For the moveable boom type cranes, such as whirlers, the motor overload protection will not be adequate to assure protection, since the safe work load will vary with the boom position. Load strain gauge limit switches with boom angle compensators have been developed and used with some success to provide safe working load limits. It may be desired by the Industry to recommend a code requirement for this type of load limit protection. The interpretation of the code requirements for the grounding of cranes is a subject often discussed by builders and users. The American Standards Association code states in Sec-

tion 104, Paragraph 1042 (b)—"All motor controller, and switch frames shall be grounded." Paragraph 1041 (a) of the same section also states in part, "wiring and equipment shall comply with the National Electrical Code . . ." Article 614, Section 6144, of this code states "motor frames, tracks, the entire frame of a crane or hoist, and cases of controllers shall be grounded in the manner specified in Article 250 . . ." A question often asked, "are grounding conductor straps between the motors, controllers, etc. and the structural frame required by the code?" It is the writer's opinion that Article 250, Section 2558, of this code clearly states that the use of such grounding conductor straps is not needed. This section of the code is quoted—"Equipment on Structural Metal. Electric equipment secured to and in contact with grounded structural metal frame of a building shall be deemed to be grounded. Metal car frames supported by metal hoisting cables attached to or running over sheaves or drums of elevator machines shall be deemed to be grounded if the machine is grounded in accordance with this code."

Another question often asked—"is a grounding collector shoe needed between the runway rail and the bridge or trolley, or do the bridge or trolley truck wheels provide an accepted continuous path to ground?" It has been the writer's opinion that the truck wheels provide an accepted grounding path.

Some time ago a request was made of our corporation to comment on a new proposed two-wire direct current grounded installation for a material handling bridge where the bridge runway rail would be used for the grounded conductor. As such installations are not often considered and as there were very few safety code rules to serve as a guide, it is believed you may be interested in the following comments that were offered.

Article 250, Section 2593, of the National Electric Code for two-wire direct current circuits states in part "the carrying capacity of the grounding conductor for a direct current supply system shall be not less than that of the largest conductor supplied by the system . . ." A separate conductor insulated from the bridge structure for the grounding circuit was recommended along with collector shoes for the bridge runway rail grounding circuit pick-up, and a collector rail and shoe for the grounding circuit to the main trolley. The grounding circuit to both power and control circuits was to be solid without switches, breakers, or contactors. It is generally recognized, of course, that the grounding circuit should never be broken. Thus the comment was offered to serve as a flag to controller builders that their conventional bridge controllers with breakers, switches, contactors, etc., in both sides of the line would not be suitable for this installation. It was recommended that all contactor coils, control

coils, and relay coils of magnetic controllers be wired so that one side of the coils be connected direct to the grounding conductor and that all control interlocks, master switch contacts, etc., be wired between the other conductor and the coils.

Standard Practices

During the past few years a number of groups have discussed the desirability of preparing and establishing standard recommended practices for electrical installations on cranes, hoists, whirlers, bridges, etc. Today the electrical insulation on material handling equipment is made to conform with adopted safety codes and the electrical practices of the equipment builders and the users. Their practices are formed by their past experience as well as by application data offered by the builders of electrical equipment. It would be the purpose of preparing such a standard to offer to the Industry in a concise form material relating to this type of equipment. Builders and users should be called upon to present their practices developed by their experience and to formulate recommended standard practices. Such a standard should clearly define the terms and conditions covering the design, construction, application, and installation of motors, generators, brakes, controllers, resistors, switches, breakers, lights, wire, conduit, etc. It is believed that with the establishing of such standard recommended practices, equipment will generally be of better quality and of course improved quality results in the improved safety of the equipment.

Industries today are demanding that materials handling equipment be built to move materials at a faster rate and with improved safety. In previous remarks the desirability of recommending code rule additions to provide crane travel limit switch protection along with controlled motor acceleration and deceleration to keep load swing to a minimum was pointed

out. The angle of load swing to provide safe handling will vary with the type of load. Standard recommended practices should include a classification of loads with suggested maximum acceleration and deceleration rates to be used in the design of the equipment to assure safe operation.

Specifications for equipment often specify totally enclosed motors and upon investigating it is found that operating conditions in many cases would permit the use of open, drip-proof or splash-proof motor construction which would result in a reduced equipment cost. By establishing standard recommended practices which clearly define and classify motor types and which recommend suggested types for various applications, the user will be assured of obtaining quality equipment at economical cost.

The comments which have been made on individual items as suggestions for incorporating into standard recommended practices cover only a few of the many items

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NEW, IMPROVED DIRECTORY

Many months have been devoted to improving the 1949-1950 FLOW Directory of material handling equipment and accessories since the first issue made its appearance. There will be more product definitions and sketches; more pages of engineering data; new pages added to other sections. A new "Who Sells It" section will feature local agencies and outlets of manufacturers, showing where you can buy it locally. $5 per copy.

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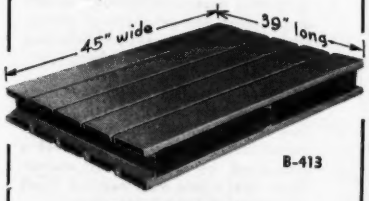

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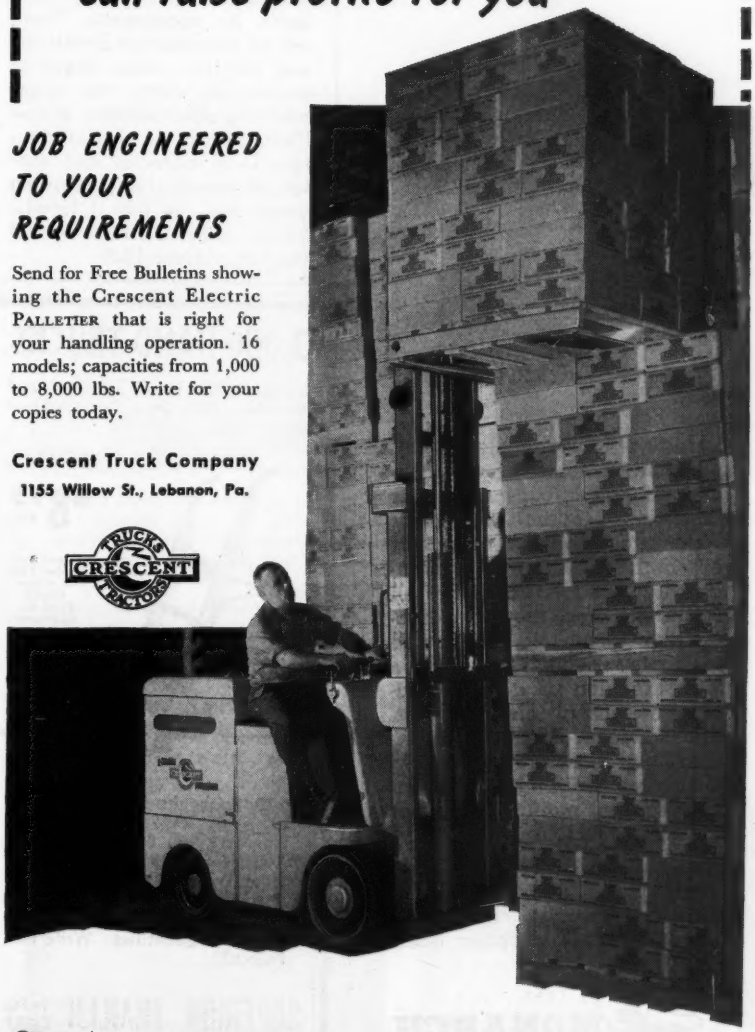

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that could be discussed to indicate the need for preparing and establishing standard recommended practices for cranes, hoists, whirlers, bridges, etc.

In conclusion it is necessary to always emphasize that all hazards cannot be guarded by mechanical or electrical means alone. For safe operation of equipment it is essential to have competent and careful operators thoroughly trained in the proper operation of the equipment.

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INSTITUTE NEWS . . .
(Continued from page 41)

tion and Material Handling."

A COMMITTEE of eastern technicians and engineers in packaging and material handling has formed what is formally known as the Eastern Division of the Society of Industrial Packaging and Material Handling Engineers. The group is headed by Dr. Louis C. Barail, director of the Bacteriological and Biological Division of the United States Testing Co., Inc. The group was founded so that frequent meetings may be held in New York for the purpose of studying better packaging. Dr. Barail was elected first vice president.

OVER 150 members and guests attended the February meeting of the New England Chapter of the Material Handling Institute, held at the University Club, Boston. Main speaker was Harry Gorden of the executive department of the General Electric Co., Schenectady. He spoke on "Controlling The Maintenance Costs in Material Handling." The G. E. film, "Material Handling in Receiving, Warehousing and Shipping" was shown. The new officers of the chapter are: president, Lyman E. Nivling, Lewis-Shepard Products, Inc.; vice president, James Gallery, Quincy Market Cold Storage & Warehouse Co.; secretary, Sears L. Hallett, Modern Material Handling; treasurer, Robert Abel, Robert Abel, Inc.

THE March meeting of the Central New York Chapter, Syracuse, heard C. F. Kells speak on "Establishing Cost Analysis Systems for Material Handling Systems." An extra session of the chapter will be held on April 26 for the purpose of showing a sound movie, "Material on The Move At The International Harvester Co." Speakers will be announced later.

MATHEW W. POTTS, consulting editor of Distribution Age, spoke before the March meeting of the Midwest Material Handling Society, Chicago. His topic was, "Material Handling Equipment for Intra-Plant Shipments." The program committee has announced a panel discussion for the April 12 meeting. The speakers will include Glyn John, Slick Airways, and E. Dahill, freight loading and container section, Association of American Railroads. The subject of the discussion is "Hidden Dollars and Cents in Air and Railroad Freight Transportation."

THE Detroit Chapter of the Material Handling Section of the American Society of Mechanical Engineers will hold its April 20 meeting at the Engineering Society of Detroit. A panel discussion will be presented on the subject of education. University representatives will participate.

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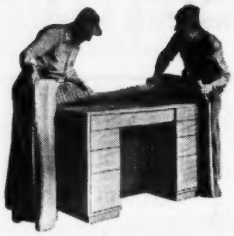

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All photographs courtesy of Drexel Furniture Co., Drexel and Morganton, North Carolina.

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PACKAGING MECHANICS SECTION

CONTENTS

Candy processing and packaging on . . .

Wire Mesh and Canvas Belt Conveyors

Two 120-foot conveyor lines and an automatic wrapping machine package 15,000 trays of candy per day. Bulk containers are packed with equal efficiency.

CANDY IS TRANSFERRED from paper onto conveyor. Note trays at right, enrober at rear.

BATTER for this candy is mixed on the fifth floor and flows by gravity through pipes to an extruding machine on the floor below. Coconut is added, and the candy is formed on trays lined with two sheets of wax paper laid side by side. The full trays are stacked 32 to a skid, and taken by hand lift truck to the second floor.

Candies Coated Mechanically

Final stages of production and most of the packaging take place on two parallel 120-foot lines of connecting conveyors. The description of one line will serve as an example. A tray-loaded skid is spotted at the beginning of the line and a waxed paper, holding 112 candies, is placed on the conveyor (the width of one sheet corresponds to that of the belt).

The belt is 16 inches wide and normally travels from five to 10 feet per minute. The first four-foot section of conveyor removes the candies from the paper, as follows. Two operators hold the paper against the belt as it travels around the idler, while the movement of the belt transfers the confection to the second section or "bottomer" conveyor. This section, a wire-mesh belt with ¼-inch openings, passes over a small tank filled with chocolate. Inside the tank, a revolving drum forces chocolate up through the belt openings around the bottom of the moving candies.

The confections are then picked up by an 11-foot-long canvas belt conveyor. Directly beneath the running surface of the belt is a long pan of ice water which aids in cooling the chocolate. From this belt the candies pass to the enrober machine—consisting of another section of wire mesh belt, and a large tank filled with chocolate. At this station, the chocolate is pumped up around the bottom and sides of the candy, so that three-fourths of the confection is covered. Chocolate is applied at two stations to assure an even and thorough coating. On the other side of the enrober, an inspector checks on the appearance and spacing of the pieces.

The candy leaves the enrobing machine and passes onto a specially

LOWER CONVEYOR is used for packing trays. Top conveyor feeds bulk containers to packing table.

TRAYS ARE FED from castered table to automatic wrapper. Operator (right) packs masters.

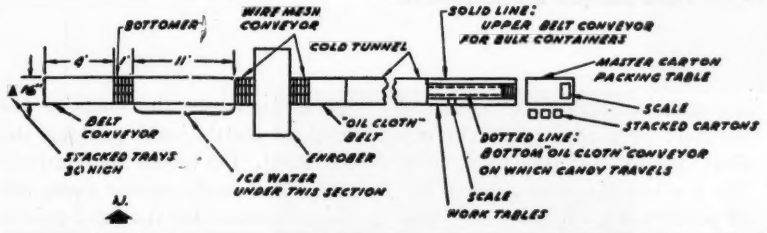
treated, smooth-surface belt conveyor which has the appearance of oil cloth. It is designed to prevent the candies from sticking to its surface. This belt travels through a 75-foot-long cold tunnel whose 55-degree temperature hardens the chocolate sufficiently for packaging.

Double-Deck Belts—Faster Packaging

The confection continues through the tunnel to the packaging tables which flank the belt on either side. At this point, a second belt conveyor runs 20 inches above the first in a double-deck arrangement.

Candy is packed in small boxes a time to a castered table and delivered to the automatic wrapping machine. There are two reasons why this machine is not placed at the end of the conveyor. 1. Two types of packaging take place on the one conveyor system. 2. The machine is used to wrap other candy made by the company.

The trays are placed on a platform and propelled by a push bar conveyor. The trays are lifted into the end-fold machine, where clear or printed cellophane is wrapped around them, and the ends tucked and heat sealed. After sealing, the ends are held securely by two small sections of belt conveyor which also



FLOW SHEET shows connecting conveyors and packing tables. At right, double-deck conveyors.

containing 14 pieces, and in bulk containers. Five-pound boxes, designed for the bulk packaging, are assembled and brought to the line on skids. Operators insert a cardboard separator, fill one layer, insert a waxed liner and another separator and complete the filling. For packaging, one girl is stationed on each side of the line, while a third operator keeps up the supply of cartons in addition to packing. The full box is placed on the upper belt which slopes down and feeds to the final packing table.

Here, another operator labels and assembles the tops, and places them on the filled cartons. Six of these five-pound containers are placed in master shipping cartons, 20 of which are stacked on a skid and taken by hand lift truck to the shipping room.

Individual Packages—15,000 Per Day

The smaller packages (referred to as trays since they have no tops) are piled on tables behind the packers. When filled with 14 pieces of candy, they are stacked on the conveyor tables, then transferred 26 at aid in moving the packaged candy from the machine onto a 3½-foot gravity roller conveyor which feeds the first packing table. Here, 12 of the individual boxes are put into larger cartons which are fed via another roller conveyor to the final station where six are placed in shipping cartons.

This machine wraps approximately 15,000 such individual boxes in an eight-hour day. Although there are faster models available, it was found that the small pieces of candy would be shaken out of the boxes (prior to the application of the cellophane wrapper to the open tray). Thus, the model used is the most efficient in relation to the packing requirement.

Packaging operations on the two conveyor lines which process the Coconut Tips may be changed to meet the demand for either bulk or individual boxes. Normally one line packs the five-pound bulk cartons, while the other feeds the individual trays to the wrapping machine. When large orders are received for one or the other, both lines are changed to one type of packing.

PACKAGING MECHANICS SECTION

Ceramic Insulator Packing--

for fast handling with least breakage

How this manufacturer of porcelain insulators increased packaging production and cut breakage. There is considerable ingenuity in this handling system, which uses standard equipment.

LOCKE INC., Baltimore, Md., is a manufacturer of porcelain insulators and pole line hardware. The hardware figures only incidentally in this description, which is devoted primarily to mass-handling techniques of vulnerable insulator shells and assembled insulators.

A Varied Problem—and Solution

Millions of ceramic items move through this plant monthly—from the continuous tunnel kilns through cooling, inspection, testing, temporary storage, assembly, packing and shipping. Excessive handling of individual pieces must be avoided if breakage is to be held to a minimum.

Here are some of the main problems that had to be considered in planning a material handling system. The insulators produced range in weight from ½ pound up to 800 pounds each. The former are about three inches high, while the latter approximate six feet. A complicating factor is caused by new and special designs that come in almost daily. Space conservation was another important consideration in the planning for better flow and safe handling of the vulnerable products. (Yes. space is also at a premium in this 13-acre plant!)

A combination skid-pallet handling system was devised in order to meet the triple problem of (1) minimum breakage, (2) ease and economy in handling and (3) efficient use of available plant area. The combination skid-pallet method permitted the loads to be transported either by fork lift or platform trucks, as well as hydraulic hand lift trucks which shift the loads between closely spaced work stations. The effectiveness of the present method can be appreciated from the fact that it has greatly reduced breakage as compared with the former unpalletized operation.

Dual Method Is Flexible

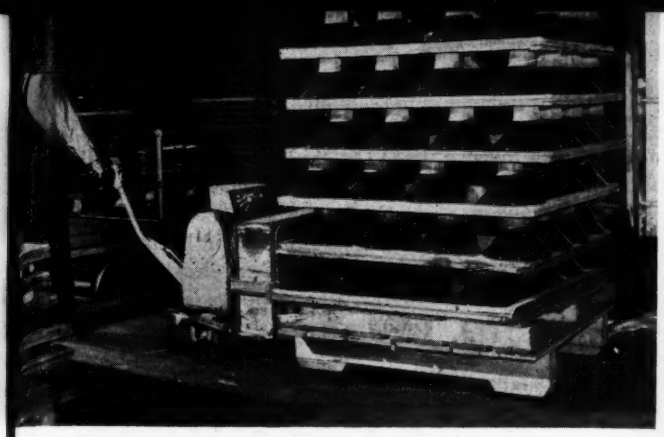
The description of the physical handling procedures begins after firing and cooling and traces the operation through two distinct departments — fired-inspection and packing, and assembly. Each is considered in turn. From the cooling area, located in the south-central section of the long plant, the insulators move north to either department. Fired-inspection and packing is considered first. The cooled pieces are assembled from the kiln cars in tray pack type loads. The 48″ x 48″ pallet size is standard throughout the plant, and the pallet is supported by a standard wooden skid with a six-inch underclearance. The layers of ceramic items are built up on the skid-pallet base to a maximum height of five feet off the floor.

Hand-guided powered platform trucks transport the loads to the fired inspection and packing department. The moves are relatively short, and fairly narrow aisles can be maintained for the hand-guided equipment. Moreover, the loads are never excessive with an average weight of 1500 pounds. And since this equipment is powered for travel, the operator's job is merely one of steering. All loads move north from cooling, whether they are destined for fired-inspection, packing or assembly.

The delivering truck spots the loads in temporary storage in the fired-inspection and packing department, which are later moved by hydraulic hand lift truck to the various inspection or testing or packing stations. For these and similar moves the pallets have to be on skids. But at various points during the progression of the flow of material the loads are picked off by riding type fork lift trucks, when the skids are left behind.

From Pallet to Shipping Container

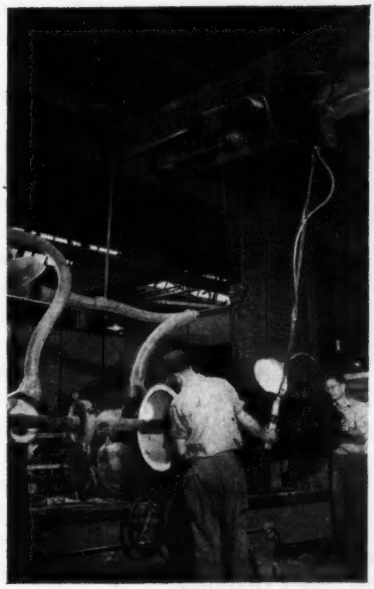
The individual packing lines in the fired inspection department are laid out so that when a piece is picked off a skid load it goes into a shipping container. The full packed containers are shunted to the end of a gravity roller conveyor line, where the units are sealed with gummed paper from a dispenser. The sealed containers are



HAND-GUIDED POWERED platform truck moves insulator shells on pallet-bearing skid. ▲

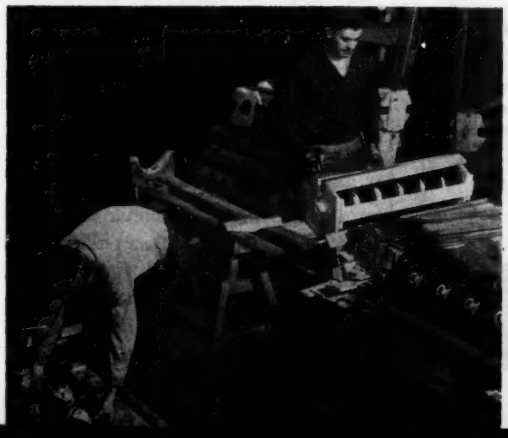
INSPECTED INSULATORS go from tray pack to shipping containers on gravity conveyor. ▼

ELECTRIC HOIST on mono-rail crane spots large bush-ing in grinder. Unit is crated. ▶

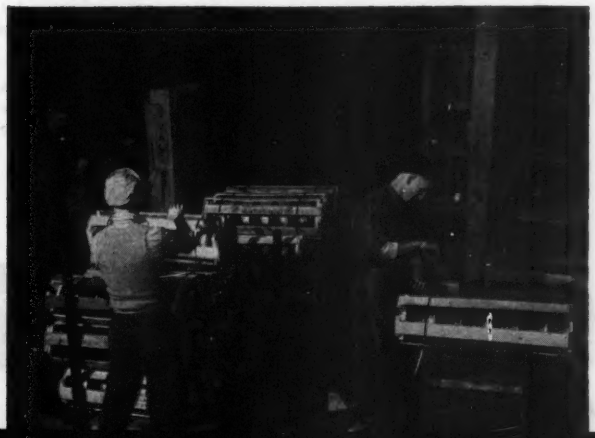


OPERATOR AT LEFT places items on rotating testing wheel; other girl loads boxes. ▼

ASSEMBLY JIG, right, with crating jig at left, used for 10" suspension insulators. ▼



▼ CRATES ARE STEEL STRAPPED on rotating jig, then loaded on pallet with corner posts.



stacked on a skid-supported pallet. The completed loads are moved by hydraulic hand lift truck (a maximum of 25 feet) to the accumulation area for outbound palletized loads. The latter are then picked off by a riding type fork lift truck, leaving the skids behind. The empties from the inspection-packing stations are picked up at intervals and returned by material handlers to the cooling area.

Pieces requiring electrical testing are taken from the test machine and packers place the tested items in shipping containers which are likewise spotted on a gravity roller line. The remaining part of the procedure, as well as the layout, is similar in all essentials to the one just described.

Methods Designed for Least Handling

The two operations mentioned apply to insulators in the small to medium category. The heavier smaller bushings (averaging about 28 pounds each), are likewise piled in layers on the combination skid-pallet load carriers, and are packed from the skid-pallets.

Large power bushings, which range from above 1'-6" to 6' in height, are brought in by platform trucks loaded single-deck on skids. Individual handling is of course indicated for these large and heavy items.

Completed units are lowered by electrical hoist into wooden crates for shipment. Beyond this point, handling-in-quantity methods again enter the picture. The crates are stacked on pallets, which are run by fork lift truck into highway vehicles or freight cars for loading.

Fast, Efficient Packing

One of the more important items in terms of volume is the suspension insulator, a circular porcelain shell 10" in diameter with a metal cap projecting 4" at one end and a metal pin extending 1½" at the other. Like some of the smaller items mentioned before, these are shipped in very large quantity all over the world.

The flow during packing progresses from east to west, and the layout is designed for the simultaneous assembly in strings and packing.

The required number of insulators is taken from the conveniently spotted pallet load and set on their sides in the assembly jig, where they are strung together. The assembled string is then transferred to the crating or nailing jig, which adjoins the assembly jig at right angles. A crate has been previously placed in position to receive the insulator assembly. Two slats are nailed across the open side of the crate, closing it.

A few feet west is the next position—rotating jigs where steel strapping is put around the crate. The load is merely rotated for the application of one band of strapping at each end. The completed crates are disposed of on a standard (48" x 48") double face pallet with corner posts, as shown. Fork trucks whisk the loads into outbound carriers.

(Turn to page 79)

THE ultraviolet spectograph is showing the storage battery industry (which uses over 30 per cent of all lead metal) new ways of coping with a difficult national lead supply situation. The speed and exactness of the technique detects and measures minute amounts of antimony, copper, cadmium, calcium, bismuth, silver, zinc, tin and arsenic. One of the first battery producers to use a modern ultraviolet spectrograph and densitometer in regular research and plant control work is Gould Storage Battery Corp. at its Depew, N. Y., research laboratories. With it, as many as 18 lead samples can be analyzed in two hours. Heretofore, over two weeks of chemical laboratory work would have been required.

J. C. MALCOLMSON, technical advisor of the Robert Gair Co., Inc., has been chosen to succeed the late Edgerton A. Throckmorton, as a director and vice president of the American Management Association in charge of AMA's Packaging Division. Malcolmson will assume direction of the association's publications, research and conferences sponsored by the packaging division.

A SUCCESSFUL new process for depositing a thin film of zinc on magnesium permits for the first time the electroplating of magnesium by essentially standard techniques, according to recent announcement by The Dow Chemical Co. Electro-deposits of any of the commercially plated metals, such as chromium, silver, gold, copper, brass, cadmium or zinc, now may be applied to any commercial magnesium alloy.

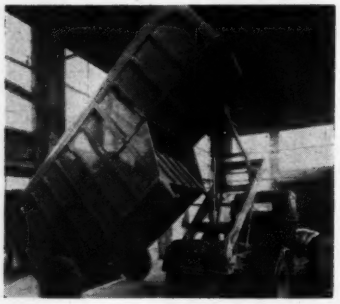
THE widespread racket commonly referred to as in-plant gambling is costing many employers thousands of dollars in production losses, year in and year out, according to Labor Relations Institute, New York. The L.R.I. study includes an easy-to-calculate formula designed to determine exactly how much in-plant gambling actually costs an employer in dollars and cents. This formula is said to be applicable to any size company. Gambling exists in most offices employing 20 or more employees. The complete study, including the application formula, will be sent upon request. The Institute's address is 1776 Broadway, New York City.

LEADING industrial and military men from the United States, Canada, and the United Kingdom recently participated in a joint conference on the unification of screw threads. It was held at the National Bureau of Standards, Washington, D. C. Among those representing the U. S. were James Forrestal, Charles Sawyer, Kenneth Royall, John Sullivan, and W. Stuart Symington.

RUBBISH COLLECTION . . .

(Continued from page 38)

During the early years, we used flat-top 1½ ton stake body trucks to transport the rubbish to the Salvage Department. As the load



CLOSED-TOP semi-trailer sawdust collector, with 21 cubic-yard capacity, in dumping position at right angles to furnace.

built up, we found that this simple equipment was not adequate for all purposes. Today, these trucks are being retained to give flexibility in certain special services. The chief means of transport for these waste materials is the type of tractor-trailer shown in the accompanying photos. This unit has usually a 158-inch wheel base, an 85 HP engine, and closed cab and chassis.

The tractor unit is equipped for semi-trailer operation with a hoist mechanism which is provided with a special tilting frame and a 24-inch rubber-mounted interchangeable 5th wheel and double arm system. These permit the trailers to be elevated a minimum of 12 feet in order to attain a 40-degree dumping angle. The advantage of the universal mounting is that it permits the dumping of the trailers at 90 degrees or any other angularity with the tractor. This feature was necessitated by the position of the incinerator in the Salvage Department, where room does not permit a straight run through the operation. Special accessories were added in order to give the proper cab-to-axle dimension for the hoist mechanism.

The semi-trailer unit comprises a steel body 16 feet in length, with a seven feet clear inside width and a six-foot high roof. The body has been provided with removable expanded metal screens over all openings other than the rear and side lift-out panels. This prevents such rubbish as paper from being blown around the plant and keeps the rubbish dry, making for ease in dumping. The panels are easily removed and so arranged that loading can be done from either side or end.

The semi-trailers are equipped with parking brakes which are hand lever operated. Their capacity is 21 cubic yards. The tractor end compartment of the trailer has a shelf for classified rubbish items.

For maximum flexibility, one tractor is arranged so that the drag links are equipped with removable pins. This allows the entire hoist assembly to move in the primary lift plane. We can thus mount on this 5th wheel a 10-foot contractor's body and use the dump feature for maintenance work and other general operations.

We have 29 of these trailers and five tractors which are supplement-

ed by three 1½ ton stake body platform trucks, and in addition, two large converted 35 by seven foot flat top trailers and several wagons for sawdust. More recently, we also adopted a sawdust trailer to the standard trailer dump handling service.

For the specific purpose of handling large items of crating, wood and boxes, we have been using six stake body 10-foot trailers of the 5th wheel drag type.

At the present time we are handling 500 loads a week, of which 250 are trailer loads handled by tractor. Approximately 750 miles of plant travel per week are necessary to accomplish this task.

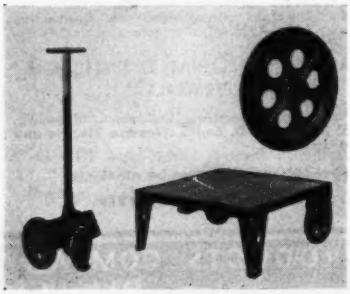
Industry recognizes today that adequate provisions for the efficient handling of scrap and rubbish are a responsibility not remote from any other phase of the manufacturing cycle. Our adherence to this policy has paid off through elimination of interference with production and through better use of available areas for manufacturing

NEW PRODUCTS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

RUBBER-TIRED WHEELS

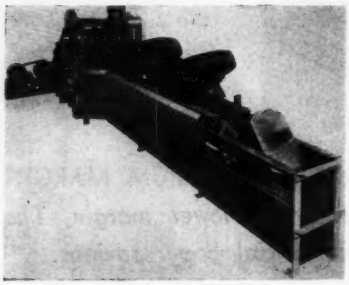
NP1—Latest improvement in the Turner System of material handling is a new rubber-tired wheel which fits all mobile units of the System. Manufactured by Factory Service Co., it is designed to save wear on floors, and provide an



easier ride. It is said to be noiseless, spark-proof and long-wearing. The wheel is 11″x2″ and consists of a 9″ diameter cast steel core and a solid rubber tire, 1″ thick. The wheel fits a ¾″ axle and is equipped with roller bearings and pressure lubrication fittings. It is further stated that trucks equipped with these rubber-tired wheels are capable of carrying loads up to 2400 pounds.

TIRE MOUNTING MACHINE

NP2—This tire mounting machine, built by Allied Steel & Conveyors, Inc., is designed for automatically mounting tires on rims. It is designed for use with automobiles, airplanes, farm implements and other units where a relatively large amount of tire mounting is involved. The machine is compact and is able to mount tires while they



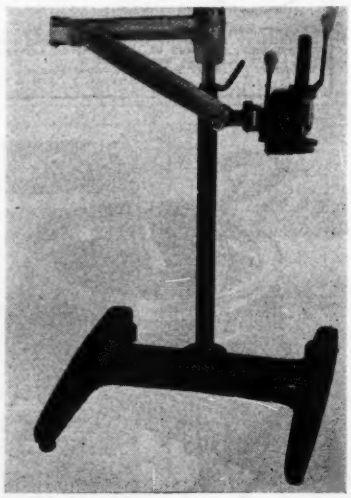
are moving on the production line. The mounting head of the machine automatically and selectively mounts mixed sizes of four-ply or six-ply tires on rims 15 or 16 inches in diameter, at a rate of upwards of 300 tires per hour.

FORM TRUCK

NP3—Towsley Trucks, Inc., is manufacturing a line of form trucks designed for use by electrotypers, typographers, printers and publishers. Constructed entirely of steel, the trucks' features include easy, safe placement of forms in the V-shaped slotted racks; no upkeep or maintenance; convenient height for loading and unloading; and capacity of 2300 pounds. Models are available 25 inches high, to top of bed, with overall lengths of 45 inches. Semi-steel and rubber-tired wheels are available.

TOOL MOUNT

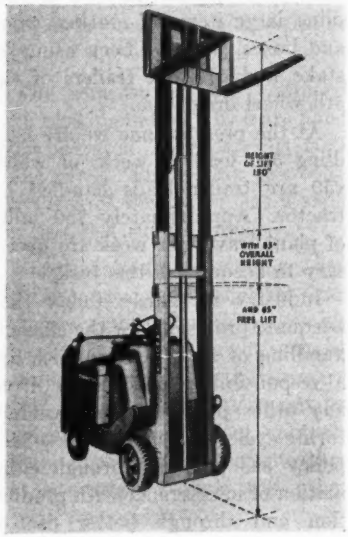
NP4—The Acme Steel Co. has introduced a new E5 Universal Tool Mount. The unit has rubber casters for portability and four leveling screws on the base for eliminating wobble on uneven floors. The mount has a 17-inch ver-



tical movement without post adjustment, a post adjustment of 21 inches, or a total of 38 inches vertical movement. The center post is spring-mounted for easy adjustment when the package falls out of the 17-inch vertical movement. The strapping tool can be used in a 360-degree circle around the post.

HIGH FREE LIFT MAST

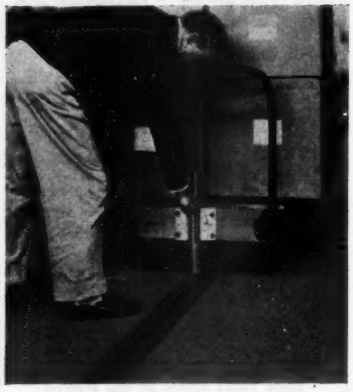
NP5—A new high free lift mast for Towmotor models LT-40, 44, and 48 has been developed by the Towmotor Corp. The models have a total lift of 130″ and a free lift of 65″ with lowered mast height of 83″. Another feature of the mast is that it affords good driver visibility and at the same time main-



tains standard capacity ratings. The truck models on which the mast is available range in capacity from 3000 to 5000 pounds.

FLOOR-TYPE TOW CONVEYOR

NP6—A floor-type tow conveyor, the Towveyor, has been developed by the Jervis B. Webb Co. It consists of a continuous chain conveyor with the chain running in a steel slot below the



floor. The simple towing pin device is bolted to the end of a standard four-wheel truck or trailer. Standard two-wheel trucks may be used with a dolly. Trucks are set in motion by dropping the pin into the slot. One of the pusher dogs, spaced at suitable intervals on the chain, engages the pin and moves the truck along the route. Disengaging is effected by lifting the pin. The truck

may then be handled in the normal manner. Routes may be laid out in all directions throughout the plant. The trucks will not pile up but will hold their spacing around the circuit.

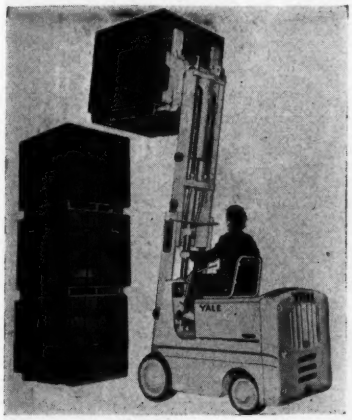
POSITIONING UNIT

NP7—The AMF Industrial Lowerator is a combination material handling, storage and transportation unit. It is manufactured by the American Ma-

chine & Foundry Co. Parts are always at operator's hand level, both for machine loading and unloading. Wasted motions, back strains and accidents from manual lifting are eliminated. It is further claimed that no outside power is needed because the unit is actuated by self-contained springs.

GAS TRUCK

NP8—The Yale & Towne Mfg. Co. has introduced a new gasoline-powered industrial truck. To be known as the Lift King, it will feature fluid drive, automotive controls, hydraulic piston lift, and low-mast heights with high free



lifts. Other features include: a 30-foot per minute lift under full load; clear full vision; six-cylinder 65 BHP Chrysler engine; shockproof steering; automotive-action hydraulic brakes; cleated cushion tires; heavy all-steel construction; and heavy-duty hypoid gearing.

MAGNETIC PULLEY

NP9—A new permanent magnetic pulley which incorporates a special design of Alnico metal poles, self-energized and requiring no electrical current, is announced by Stearns Magnetic Mfg. Co. The pulley is applicable for automatic removal of tramp iron from raw or processed materials; for separation of magnetic and non-magnetic products; for reclaiming secondary metals; and protection of machinery, grinders, pulverizers or similar equipment. More than 50 sizes are available from 12" diameter by 12" wide to 30" by 60".

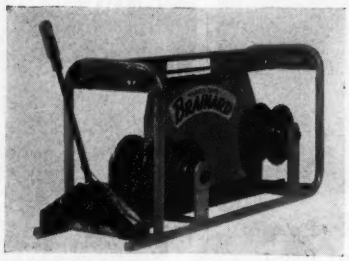
CHAIN CONVEYOR

NP10—A new flexible chain conveyor for use where a constant flow of material or assembled products is needed is available from the Chain-O-Flex Corp. The conveyor is designed for quick assembly. All parts are bolted together and corners are highly flex-

ible and adjustable to any desired degree. Variable speeds are obtainable by adjusting the band wheel on the drive unit which will provide a 3:1 ratio. Multiple drive units may be installed on extremely long systems.

STRAPPING EQUIPMENT

NP11—The Brainard Steel Co. has introduced a new coil holder and strap cutter combination that is fully adjustable for ¾-inch, 1¼-inch, and 2-inch heavy duty strap. The holder will ad-



just for two coils of the sizes given above or any combination of these sizes. Two cutting blades cut one or two straps at one time.

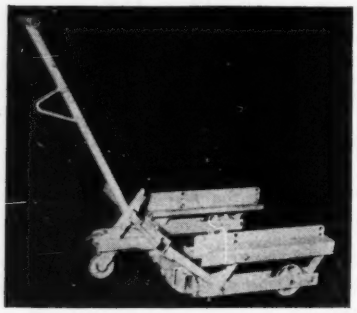
CONVEYOR BELT

NP12—A new gripping surface for its Hi-Climber conveyor belt has been designed by the Goodall Rubber Co. The belt is designed for conveying packages on inclines up to 35 degrees, and is constructed with a soft, gripping pure nat-

ural rubber cover. The cover has been developed to prevent longitudinal as well as slide slippage.

ADJUSTABLE TOTE PAN LIFT TRUCK

NP13—Lyon-Raymond Corp. has announced a new tote pan lift truck. It is adjustable in width and lowered height. This two-way adjustment allows it to be used with practically all



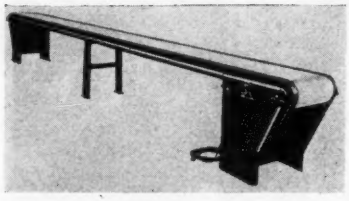
standard tote pans ranging in width from eight to 24 inches. The truck's width may be changed by loosening eight set screws and contracting or expanding the telescopic frame as required. Two types are offered: a narrow model for handling tote pans from eight to 16 inches wide; and one for pans from 16 to 24 inches in width. The forks are 22 inches long. Loads up to 1000 pounds can be accommodated.

BATTERY CHARGER

NP14—The Electric Products Co. has anounced a newly redesigned battery charger for servicing motorized hand lift trucks. Known as the Chargette, it is operated by plugging together the charging cable connector and turning the pointer to normal charge position. The charger shuts down completely when the battery is fully charged. It also stops in case of power failure. Every part of the unit is readily accessible for inspection and maintenance. The charger is available in seven ratings to service various types of batteries. For further information, use postcard bound into this issue.

BELT CONVEYOR

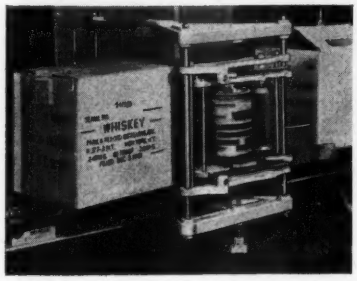
NP15—The Mar-Rail Conveyor Co. is manufacturing a stock model belt conveyor to be known as the Flo-Table. Features include smooth pressed steel precision units; safety enclosed drive



and takeup; standardized, interchangeable beds which offer slide, roller, live roll or troughing types. Belt widths are available from six to 36 inches in two-inch multiples. The unit may be floor mounted in heights from 18 to 37 inches, or ceiling suspended. Lengths to 100 feet and more have 10 to 100-pound per foot capacities depending on length. A new bed type can be inserted at any time to handle a different product due to production change.

CARTON MARKER

NP16—Designed for use on conveyor lines is this carton marker available from the Industrial Marking Equipment Co. Friction between the marker and the moving package or carton will

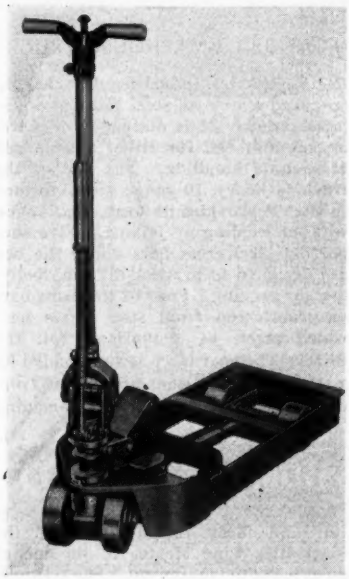


imprint date, code or any other information. It will automatically spot-print a one to 10-line legend. According to the release, it can be easily attached to a conveyor, packaging or sealing machine or work table. Inking is through a felt roller that has a self-contained reservoir. Interchangeable rubber type may be used. The marker is recommended for candy manufacturers, distillers, oil companies, food

packers, etc., for marking filled bags, cartons, boxes, rolls, cans, etc. Additional information may be had by using the card bound into this issue.

MECHANICAL LIFT TRUCK

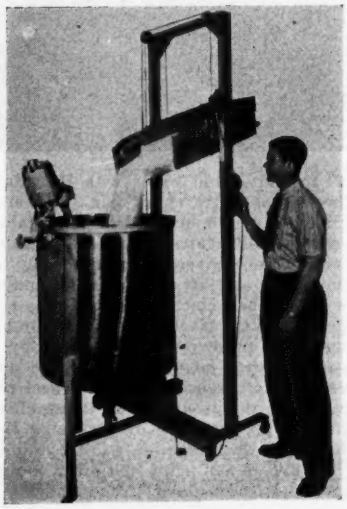
NP17—The West Bend Equipment Corp. has introduced a new Weldbilt single stroke mechanical lift truck. The handle swivels a full 360 degrees and is so engineered that it applies maximum lifting force regardless of angle.



Another feature is an automatic anti-kickback handle release, which assures greater operating safety. A foot pedal releases the center holding latch for hydraulic shock-proof lowering. Capacities are available from 2000 to 2500 pounds. For further information, use the card bound in this issue.

UPANOVER

NP18—Upanover is the name of a new portable skip hoist manufactured by Jacob House & Sons, which is designed



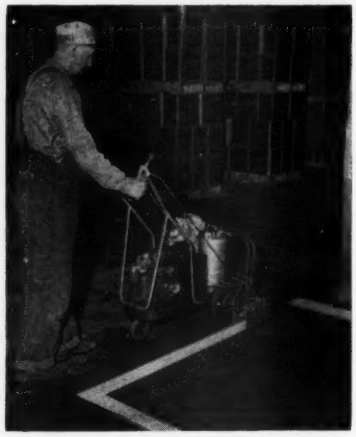
to lift and dump 100-pound bags. Alternate skips are available for barrels or drums up to 250 pounds. They are constructed to almost any height—portable units for one-story operation, stationary units for two-story applications. The bag dumping unit occupies a floor space only 21"x34", and requires a headroom of 34 inches above the edge of the tank or bin. It is able to dump original containers at the rate of 60 to 75 per hour. The models are mobile with the aid of rubber-tired ball-bearing casters.

FLAT-BED WAREHOUSE TRUCK

NP19—Garrick Industries, Inc., has introduced a new all-steel flat-bed warehouse truck. It is designed for warehouses that call for either mechanized or manual handling. The bed of the truck is heavy 10-gauge steel, formed so that it provides its own side flanges, without welding or joining. Five supporting steel cross bars under the bed are designed to prevent it from "bellying" or sagging. Four of the cross bars are fabricated from steel angle bars which serve as mountings for the wheels. The rear hitch is surrounded by a steel guard rail that prevents it from punching and accidentally damaging goods.

LINE MARKER

NP20—The Universal Mfg. and Sales Co. announces the addition of the Mark-Rite Line Master to its line of floor marking equipment. The self-propelled unit reproduces lines from 2" to



6" in width, and wider with the addition of an extra spray gun. The machine may also be used as a portable spray rig. Features include a split axle, with power delivered simultaneously to both right and left drive wheels through a twin V-belt clutch. The clutch is engaged and the machine set in motion by means of an air cylinder operated by a valve control lever located at the operator's left hand. The rear wheel remains on the ground at all times, eliminating the necessity of jockeying the machine when painting a curved line. The five-gallon paint container is removable for cleaning.

SAVES 1/3 MAN HOURS

IT's estimated by S. C. Johnson & Son Inc. that the Cesco Dumper saves ⅓ of their man hours in addition to eliminating back-breaking labor and personal liability.

The Cesco Dumper lifts and dumps any free flowing material up to 500 lbs. at the touch of a control button. Built for various heights with skips for any use—barrel, truck, open, dustproof, bag.

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FEATURES: Stability without stabilizers; 100% vision in all directions; load and boom operations, and crane travel, performed simultaneously or independently; automatic limit stops for all crane operations; automatic braking of load and boom; no tail swing and no part of crane passes over operator. ***KRANE KAR*** will transport any load it can lift.

Gas or Diesel. 9 to 37 ft. booms or adjustable telescopic booms. Electric magnet, clamshell bucket, and other accessories available.

THE ORIGINAL SWING-BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER
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...Still the low cost time proven method for efficient and economical handling of materials.

Here's how one manufacturer is reducing handling costs on production line loading of semi-live skids with special Ironbound tiering trays.

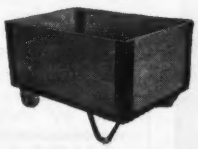
Skids or semi-live skids can be made for use with box tops or trays to provide tiering, space-saving mobility. You, too, can stack, tier or handle special materials with various types of superstructures.

We can show you how a skid system will work in your plant to save you money. Write for illustrated literature describing many Ironbound standard material-handling units.

ROL TRUK

THE IRONBOUND UNIT FOR SIMPLIFIED HANDLING OF PAPER ROLLS, DRUMS, BARRELS, REELS, KEGS, ETC.

● The Ironbound RolTruk will "pick-up and go" with cylindrical items weighing up to 2000 pounds. Available in models to meet most every roll handling requirement. Ask for special fully illustrated 6 page bulletin 10-RT.



Typical removable Ironbound Box Top on standard Semi-live Skid.

IRONBOUND
BOX & LUMBER COMPANY
Materials Handling Division
30 HOFFMAN PLACE • HILLSIDE, N. J.

Ironbound

SKIDS • SEMI-LIVE SKIDS
DOLLIES • FLOOR TRUCKS

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" $4.00 minimum, limit 25 words. For all other classifications $4.50 minimum for 25 words, each additional word 15c; boldface type or all capitals, $7.50 minimum for 25 words, each additional word 20c; limit 50 words. Box address count as five words. All insertions are payable in advance.

These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

FOR SALE

Mercury, 10,000 lb. capacity, low-lift platform electric truck, platform 54" long x 26" wide x 11" high, with Gould KHD-21 battery, moderately priced. Box 4249.

Heavy Duty 10,000 pound capacity automatic THTFM Fork Truck standard lift and solid rubber tires. Excellent condition, for sale with or without 3 24MEH15 Exide Batteries. Box 4349.

FOR SALE

PALLETS FOR SALE: 400 Two Way Entry, Hardwood Pallets, size 32"x40" with 32" stringers. Pallets are in exceptionally good condition. Owner has an over stock of them. Priced to sell, f.o.b. Xenia, Ohio. Eavey Company.

CAR SPOTTER SALE: Electric Car Spotter Hoists complete with Timken tapered roller bearings, bronze worm gear, sturdy steel base, vertical capstan; totally enclosed, hoist type ball bearing motor (3 phase, 60 cycle, 220 or 440 volts—other currents available). Speed approximately 40-ft. per minute. Model 5BB (5 hp motor) 5000 lbs. starting pull—$388; Model 7BB (7½ hp motor) 7000 lbs. starting pull—$488; Model 10BB (10 hp motor) 10,000 starting pull—$587.00.

AMERICAN WAREHOUSE
P. O. Box 1546 Pueblo, Colorado

2 Model POK-948 Barrett electric handlift trucks, 4000 lb. capacity, platform 24" wide x 48" long, rubber tires, in good conditions, each equipped with battery and charger. Price complete—$675.00 each. S. Riekes & Sons, 1402 Webster Street, Omaha 2, Nebraska.

BELT TYPE Lamson Conveyor, up and down, six stories, good running condition, all or part, sacrifice. 337 West 11 Street Corp., 719 Washington Street, New York 14, N. Y., Oregon 5-1070.

Shipping supply and Material handling business established for over twenty years with nine major exclusive Mill accounts — doing both jobbing and brokerage—For sale because of owners health. Address Box 4149, Flow.

REPRESENTATIVES WANTED

FORK TRUCK Salesmen wanted to sell the Moffat-Bethlehem Bridge Ramp. Engineered for safety and utility. Moffat Steel Company, 1621 East Fourth Street, Bethlehem, Penna.

USED EQUIPMENT WANTED

Wanted

Fork-Lift Trucks

Krane Kars

We Pay High Prices
For Used Material Handling Equipment

A & A Machinery Corp.

1267 Flushing Ave. Brooklyn, N. Y.
Hyacinth 7-3331

CERAMIC INSULATORS . . .
(Continued from page 68)

From this necessarily condensed description, the following facts stand out. Fired inspection is one department where proper layout, flow of material and handling procedures resulted in greatly increased output. Previously, the insulators were handled from pallet to pallet, as during inspection, and later placed in shipping containers. The new way—from pallet direct to shipping container—has obviously reduced handling costs besides materially increasing departmental production. Orderly flow has meant elimination of congestion. Excessive numbers of loads are no longer spotted around the floor awaiting handling. This is another way of saying that optimum production is obtained.

Considerations of ease in handling, avoidance of breakage and effective use of manufacturing space apply with equal force to the procedures in the assembly department. Hand-guided platform trucks, powered for travel, transport the loads from the cooling area to the electrical test area. After test they are spotted near the temporary storage stacks in the 240′ x 300′ building, where the metal components are assembled to the ceramic shells. The storage area occupies the west portion of the long room, and the flow is east during production.

Fork trucks tier the pallet loads. The height of individual loads will of course vary, depending on the complexity or the flatness of the individual shells. Stability of loads and tiers is a primary factor. Specific pallet patterns have been developed for effective use of the ware divider boards.

When needed for production, the palletized loads are picked off by fork truck and spotted for the convenience of the operators at the machines arranged in line in the east half of the room. Many metal components, by the way, are tiered in aisles adjoining the stacks of

ceramic ware.

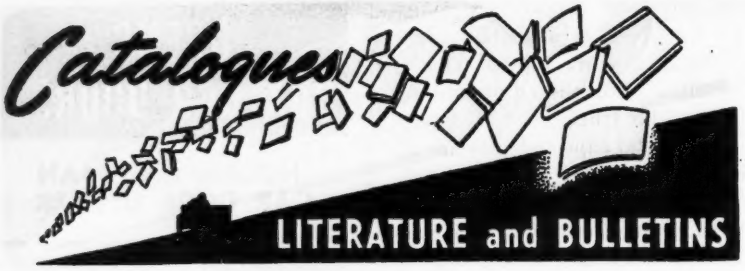
The use of 45-degree angle storage is another factor that has a bearing on safe handling and avoidance of breakage. In tiering or detiering the loads, the fork truck operator avoids the usual maneuvering necessary when the stacks are square to the aisle. With 45-degree angle storage, the truck operator can back away after he has picked off a load and travel to destination without turning. This is assurance against spilling and breakage.

Following is a typical flow through an assembly operation, which highlights the flexibility of the combination skid-pallet method. Particular processing and/or assembly operations may increase the number of moves in a given case, but such variations merely emphasize the value of the basic dual skid-pallet handling.

The previously mentioned suspension insulator shells are a convenient example. The palletized loads are first delivered by fork lift truck to a preliminary processing operation, preparatory to assembly. Next is assembly, which involves a short move. This is therefore accomplished by hydraulic hand lift truck.

The metal caps and pins are attached in assembly, where the shells are spotted beside the assembly table. One operator feeds the components to assemblers, who perform their task on jig boards. The full jigs are deposited in a multi-tiered drier rack. The loaded rack is transferred by hand lift truck to the drier, which is about 15 feet from the assembly table. The loads leave the drier at the opposite (east) end. The subsequent cleaning, testing, and inspection operations again involve short moves, to which the skid base of the load is well adapted. The next and last step is packing (in the hex crates) which has been described previously.

The moves of sizable palletized loads avoid rehandling of individual pieces in transfer operations, which has contributed materially to the large reduction in breakage.



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—"Material Handling News" . . . The first 1949 issue of the Material Handling News has been issued by the Clark Equipment Co. It describes what a fork truck is designed to do; the comparative turning radius of solid-tired and pneumatic-tired machines; the principles of counterweighting; how turning radius affects maneuverability; and other basic factors that every fork truck user, and prospect, should know. Drawings and photos of complete units as well as component parts are included.

26—Rotary Bins . . . Catalog 106-A, containing information on Rotabins and Rotabin accessories, is available from The Frick-Gallagher Mfg. Co. Rotary bins are designed for storing small parts, machine parts, supplies, fittings, etc. According to the release, because of the rotating sections, ease of adjusting compartments plus elimination of aisle space, these units save on the average of 50% of floor space. Other features include flexibility, provision for visible stock control and durability. The catalog contains installation pictures, specifications, and general operating information.

27 — Tensioners, Sealers and Accessories . . . A six-page, three-color brochure is offered by the Allegheny Steel Band Co. It pictures and describes the company's line of tensioners, sealers and accessories. Features of the equipment are said to include faster take-up; light weight; high seal-joint efficiency; alloy steel drop forging construction; and chrome plating. Also shown are trucks for mobile handling of tools and information on the company's line of seals and strapping. Installation photos show how strapping may be adapted to various products.

28—Hoists . . . The Wright Hoist Division of American Chain & Cable Co., Inc., has released a new folder, DH-65, which describes its line of Wright Speedway electric hoists. These hoists are available in capacities ranging from ½ ton to 10 tons. The folder includes information on operating features, action photos, cross sectional views of the hoist frame and complete specifications.

29—Trailer Designs . . . The Mercury Mfg. Co. has announced a comprehensive 16-page catalog covering its line of special trailer designs. Specific applications and uses of each type—caster, four-wheel steer trailer and fifth-wheel steer trailer—are also discussed. Information on the various types of trailers that are available and specifications of each is given. The factors a prospective purchaser should look for and expect in an industrial trailer are also included.

30—Cranes and Monorail Equipment . . . A new 12-page booklet has been issued by the Abell-Howe Co. on its complete line of cranes, jibs, and monorails. In addition, switches, turntables, conductor materials, crane runways, crane end trucks, hoists, and storage racks are discussed. Over 25 pictures of models and installation shots are included.

31—Tractor Shovel . . . A new catalog has been prepared by The Frank G. Hough Co. covering the new four-wheel-drive model HM Payloader. This literature contains complete specifications on this 1½ cubic yard tractor shovel, and numerous action views from a variety of jobs. Features of the model include hydraulic bucket control; several speeds in either direction; fast forward-reverse control; power boosted steering; controlled dumping; and ground-gripping traction provided by large earth mover tires and four-wheel drive.

32—Automatic Tackers . . . The new Duo-Fast "Catalog and Profitable Suggestions" is available from the Fastener Corp. This 24-page booklet contains descriptions of all the various machines, a list of some of the possible uses for this type of equipment and four pages of photos of Duo-Fast Tackers in action. The tacker is air-operated at 83 pounds of air pressure. It is said to drive staples as fast as the trigger is motivated. Staples from 5/32" to ⅜" in length may be used.

33—Crane and Monorail Systems . . . A fully-illustrated new series of catalogs on overhead crane and monorail systems has been completed by Whiting Corp. The literature covers general use and economy, fittings, carriers, electrification, assemblies, motor drives and cranes. Industrial applications are stressed. Overhead systems are built in capacities ranging from 500 to 20,000 pounds, in either hand or power-operated units.

34—Steel Drum Cleaning . . . The American Wheelabrator & Equipment Corp. has issued an eight-page booklet describing its line of airless abrasive blast cleaning equipment. It is designed for cleaning steel drums for reusage by commercial drum reconditioning plants and large manufacturers. Line drawings, photos and copy illustrate each of the types of machines designed for specific cleaning requirements.

35—Trucks and Tractors . . . A four-page bulletin is offered by the Crescent Truck Co. It illustrates 20 different models of electric industrial trucks and tractors. Also included is a questionnaire for determining the correct type and model of truck to use under various operating conditions. Fork trucks with capacities from 1000 to 8000 pounds, tractors with capacities from 1500 to 6000 pounds, and platform trucks with capacities from 1000 to 10,000 are shown.

36—Casters . . . The United States Tube & Foundry Co., Inc., is offering a four-page, two-color brochure concerning its line of casters. The casters, with 85 to 500-pound capacities are constructed of pressed steel and are designed for trucks, dollies, racks and furniture. Wheels are available of cast iron, wood or rubber. Some casters are equipped with ball bearings.

37—Conveyors . . . Belt, chain, apron, slat and gravity conveyors are the subject of a new pamphlet issued by the International Conveyor & Washer Corp. It contains many "on the spot" photos showing installation features. Case studies range from transporting chips and cushions to automobile bodies and domestic washers. Portable models are also shown.

38—Tractor Cranes . . . Henry Lohse Co., Inc., has released Bulletins 52 and 53 describing three models of its tractor cranes. The publication contains photos of the overall models as well as component parts. Engineering data, specifications and prominent features are included. Of interest is a loadreach diagram of safe lifting loads at various angles of the boom. Information concerning winches, boom heads and boom lengths is given.

39—Wire Rope . . . The Union Wire Rope Corp. is offering a series of bulletins containing general information on wire rope. Some of the subjects included are: care; installation; abuses to avoid; service life; construction; determination of the correct wire rope for replacement; types of sling patterns; and applications. The bulletins are in two or three colors and contain many line drawings and photos. Engineering data, specifications, and question and answer discussions are included.

40—Hand Lift Trucks . . . The Excel-

sior Plimptruck Co. is offering two brochures describing its line of hydraulic and mechanical hand lift trucks. Models are available with 2500, 3500 and 5000-pound capacities. According to the release, the trucks are designed so that tipping is almost impossible. Other features include single-stroke lift on mechanical models; auto-type knuckle steer; all wheels under load; vertical lift and drop; double action hydraulic pump (on some models); flexible design for different skids; and over capacity hydraulic ram (on some models). The brochures contain pictures, complete specifications, features of each model, and engineering drawings.

41—Industrial Scales . . . "Better Ways" is the title of a booklet by the Toledo Scale Co. It describes various types of scales and their applications to modern industrial problems. Pictured are giant scales able to weigh loaded coal cars and motor trucks, down to delicate models able to measure the minute change in the weight of small animal specimens.

42—Electric Counters . . . The Production Instrument Co. has released a 16-page bulletin showing its electric counters. Illustrated are applications for counting parts, cartons, mechanical operations, oranges, folding machine production, etc. Illustrations show both photo-electric actuation and operation with specially-designed actuating switches.

LITERATURE AVAILABLE FROM ADVERTISERS IN THIS ISSUE

(Check corresponding numbers on the enclosed card for the free literature listed below)

A-1. HARNISCHFEGER CORP. Bulletin H20-4 gives complete specifications, application data and photos on the company's line of hoists.

A-2. BARRETT-CRAVENS CO. will send you a booklet describing PowerOx, a power-operated walkie-type lift truck.

A-3. ELWELL-PARKER ELECTRIC CO. is offering a booklet, "Industrial Logistics", which describes scientific material handling.

A-4. MOBILIFT CORP. An illustrated folder describes the company's fork truck.

A-5. BELL AIRCRAFT CORP. Information will be sent on the Bell Prime Mover and nearest distributor.

A-6. GENERAL ELECTRIC CO. Bulletin GEA-5272 describes the company's Sequence Charge Control.

A-7. TRUSCON STEEL CO. Catalog gives specifications and details on its steel boxes and platforms.

A-8. LAMSON CORP. will send you bulletins on its pneumatic tube systems, automatic pallet loaders, blowers and exhausters.

A-9. ROWE METHODS, INC. Details are available on its hydraulically-operated Adjust-A-Dock.

A-10. GENERAL TIRE & RUBBER CO. Catalog gives information on the company's industrial pneumatic tires.

A-11. SISALKRAFT CO. will send details on the Fibreen Method of unitized loading, also sample of Fibreen reinforced waterproof paper.

A-12. HASLETT CHUTE AND CONVEYOR CO. Brochures tell of the company's line of skate-wheel conveyors.

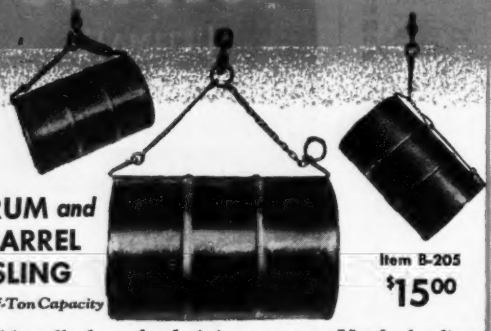
A-13. BARBER-GREENE CO. is offering bulletins on its 24" belt conveyor and hopper car unloader.

A-14. COLSON CORP. A 56-page catalog pictures and describes its drum truck and other two-wheel hand trucks.

INDEX TO ADVERTISERS

Everything You Need in

MATERIALS HANDLING EQUIPMENT



DRUM and BARREL SLING

Half-Ton Capacity

Item B-205
$15.00

Will handle drum for drainage purposes. Use for loading on or unloading truck and for general purpose handling. Will handle barrels, drums, kegs, anything with a lip such as on drum or barrel. Easy to operate . . . heavily welded chain, forged grab hooks. Weight 8½ lbs.

UNIVERSAL GRAB

Item J-631
(1000 Lbs.)
$28.90

Item J-632 (1 Ton) $35.55

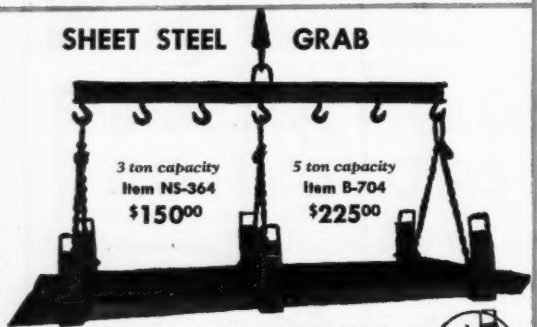
Use for picking up all types of heavy boxes, crates, bales or other loads where hooks may be used. Heavy, forged steel hooks with an adjustable spread of from 16" to 48". Adjustable for use where ceilings are high or low. Weight 27 lbs.

Item NS-288
$55.25

BARREL GRAB

For picking up any type of wood or steel barrel, box or container, from 40" diameter down to small nail keg size. Will lift up to 2000 lbs.

SHEET STEEL GRAB



3 ton capacity
Item NS-364
$150.00

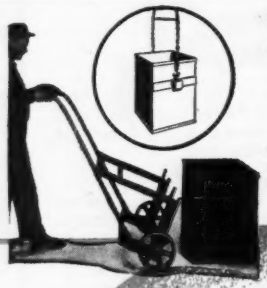
5 ton capacity
Item B-704
$225.00

For handling sheet steel bundles. Holds sheets securely without slippage, distortion or damage to stock. Engineered and built for heavy industrial use.

BOOM SKID

Item NS-416
$190.00

Make a "Boom Skid" out of any standard high lift or fork truck. Ideal for moving heavy equipment or materials. Built any size to fit individual truck.



SQUARE TRUNNION BOX & TRUNNION BOX TRUCK

Used for moving work in progress between operations. Box can be used with overhead hoist.

Trunnion Box (Minimum 10 boxes)	Trunnion Box Truck
Item B-290	Item B-268
$18.65	$45.00

Automatic DUMP BOX

Handles all types of material or parts. Used with hand, power or truck, or for pickup and moving by overhead hoist. Gravity latch locks box in upright position until ready for dumping—pull on latch releases the box—dumping is automatic.

Item B-465-B
Automatic Dump Box $79.00

Item B-465-Y
Dump Box Yoke $50.00

Item B-731 $165.00

DRUM and BARREL TILT

A barrel tilt for controlled dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive.

When Ordering Always GIVE "Item" number; this will help prevent error. All prices are f. o. b. Detroit. Prices subject to change without notice.

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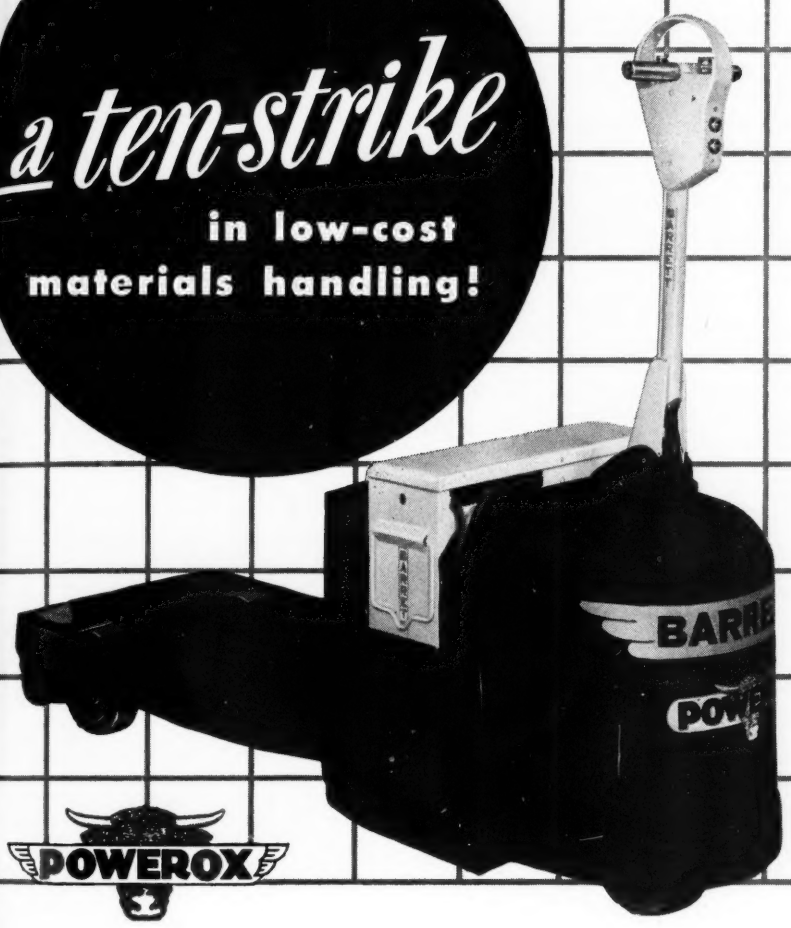
Palmer-Shile Co.

a ten-strike

in low-cost materials handling!



- **LOW COST** . . . an outstanding value
- **ELECTRIC DRIVE** . . . travels at walking speed
- **SMOOTH TRAVEL** . . . no speedups or lagging
- **ELECTRIC LIFT** . . . at the press of a button
- **QUICK LIFT** . . . 4 inches in 4 seconds
- **BIG CAPACITY** . . . your choice of two models—4,000 and 6,000 lbs.
- **HIGH FRAME CLEARANCE** . . . no snagging on inclines or uneven floors
- **EASY STEERING** . . . with full power through 270 degrees
- **SURE BRAKING** . . . with automatic, automotive brakes
- **SIMPLE OPERATION** . . . all motions push-button controlled

HERE are 10 big reasons why it pays you to lift and move loads electrically . . . with the Barrett PowerOx. Look over the other trucks in the field—and then compare them with what you get in a Barrett. No other truck can match the PowerOx—either in design, construction or operation!

With the PowerOx, you save time, money and labor. It enables *one man to do the work of 3 or 4!* This sturdy, dependable tool is cutting costs in hundreds of plants.

This same profit opportunity is open to you! Get the PowerOx story today. Ask to have a Barrett engineer call. He'll show you how the PowerOx can cut your costs—streamline your handling operations. Write . . .

It's yours for the asking—The Barrett PowerOx Bulletin.

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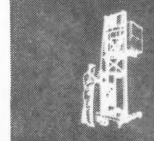
BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

Barrett Handling Equipment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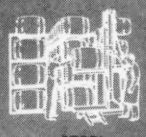
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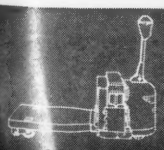
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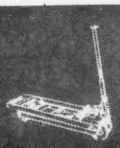
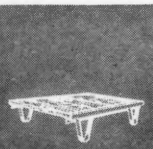

HAND LIFT-TRUCKS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BARREL TRUCKS


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MORE THAN 27,000
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Each distributor subscribes for his active and most important material handling equipment customers, and for his best prospects. The distributor pays us $1.44 per year per subscription. These constitute an "identifiable" readership composed of authenticated, known buyers and users . . . the distributors being the authenticating agents! Thus—under "C B P"—Readers-Buyers become synonomous and interchangeable . . . whether you—as the manufacturer—sell direct or through distributors—FLOW guarantees CERTIFIED BUYING POWER. These 27,000 reader-buyers comprise the known national market for material handling equipment and, therefore, are the people to whom you must tell your story. FLOW reaches more than just "people"—or "names"—or "positions"—it reaches BUYERS. Here is "CERTIFIED BUYING POWER"—around which you can most profitably build your sales and merchandising campaign.

Flow **MAGAZINE**